ECIR WORKSHOP ON

People, Power, and CyberPolitics

Co-Sponsored by

Council on Foreign Relations

December 7 and 8, 2011
MIT Faculty Club &
MIT Media Laboratory

Workshop Report
TABLE OF CONTENTS

EXECUTIVE SUMMARY

ACKNOWLEDGEMENTS

INTRODUCTION
   Nazli Choucri, Political Science Department, MIT

I. PEOPLE POWER & GLOBAL POLITICS: WHAT HAS CHANGED
   Joseph S. Nye, Jr., Harvard Kennedy School
   Gordon Smith, Centre for Global Studies, University of Victoria
   Adam Segal, Council on Foreign Relations, Canada
   Robin Staffin, Office of the Assistant Secretary of Defense for Research and Engineering

II. HOW DO WE LISTEN: NEW WAYS TO ANALYZE THE MESSAGES
   Michael Siegel, Sloan School of Management, MIT
   Gary King, Department of Government, Harvard University
   David Beaver, Linguistics Department, University of Texas at Austin
   Adam Berinsky, Political Science Department, MIT

III. PEOPLE, POWER & PRESSURES ON GOVERNANCE: THREATS & OPPORTUNITIES
   Melissa Hathaway, Harvard Kennedy School
   Joel Brenner, Cooley LLP
   Roger Hurwitz, Computer Science and Artificial Intelligence Laboratory, MIT
   Chappell Lawson, Political Science Department, MIT

IV. CYBERPOLITICS & DEMOCRACIES: WHERE ARE WE HEADED?
   James Dougherty, Council on Foreign Relations
   Archon Fung, Harvard Kennedy School
   Peter Brecke, Political Science Department, Georgia Institute of Technology
   Ethan Zuckerman, Media Laboratory, MIT
V. SOCIAL MEDIA & SOCIAL ACTION LEARNING FROM EXPERIENCE

Venkatesh "Venky" Narayananamurti, Harvard Kennedy School
Fergus Hanson, Lowy Institute, Sydney, Australia
Evann Smith, Department of Government, Harvard University
Robert Laubacher, Sloan School of Management, MIT

VI. THREE VISIONS: THE “NEXT GENERATION” OF CHALLENGES FOR PEOPLE, POWER, AND CYBERPOLITICS

Stuart Madnick, Sloan School of Management, MIT
Herb Lin, U.S. National Research Council of the National Academies
David Clark, Computer Science and Artificial Intelligence Laboratory, MIT
Jonathan Zittrain, Harvard Law School

VII. CLOSING COMMENTS: END NOTE

Nazli Choucri, Political Science Department, MIT

VIII. POSTER SESSIONS

Accountability at the Application Layer
Wolff, Josephine, SM Candidate, Technology & Policy Program, MIT

Comparative Analysis of Cybersecurity Metrics to Develop New Hypotheses
Fisher, Dara, SM Candidate, ESD, MIT

Control through the Layers in the Chinese Internet
Hung, Shirley, Postdoctoral Associate, MIT

Coordinates of Cyber International Relations
Vaishnav, Chintan, Postdoctoral Associate, MIT

Cost-benefit Analysis of CERT’s International Cooperation Activities Focusing on Korean Case
Cho, Yiseul, SM Candidate, Technology & Policy Program, MIT
Cyber-enabled Loads & Capacities Methods
Young, Jr., William E., (LtCol, USAF), PhD Student, ESD, MIT

Cyber International Relations Theory: Assessing the State of Art
Reardon, Robert, Postdoctoral Associate, MIT

Cyberspace as Ungoverned Space Methods
Hoisington, Matthew, LLM Candidate, The Fletcher School of Law and Diplomacy

The Dynamics of Managing Undersea Cables Methods
Sechrist, Michael P., Project Manager, Harvard Kennedy School
Vaishnav, Chintan, Postdoctoral Associate, MIT

Escalation Management in Cyber Conflict: A Research Proposal
Reardon, Robert, Postdoctoral Associate, MIT

Establishing the Baseline: A Framework for Organizing National Cybersecurity Initiatives
Shukla, Aadya, Fellow, Harvard Kennedy School

Finding Order in a Contentious Internet
Sowell, Jesse, PhD Candidate, ESD, MIT

Learning Legal Principles to Enable Law at Cyber Speeds
Finlayson, Mark A., PhD, MIT

Representing Cyberspace Using Taxonomies and Meta-data Analysis Cyber-enabled Loads & Capacities
Daw Elbait, Gihan, Postdoctoral Associate, MIT

PARTICIPANTS
Poster Session and Workshop
EXECUTIVE SUMMARY

Introduction

For the first time in human history, a large number of people from all parts of the world participate in a new arena of information and communication of global scale and scope. Almost everyone everywhere has the opportunity to participate in cyberspace. Few states, if any, are able to control the flow of information via cyber venues that cross their boundaries. All states are recognizing, to one degree or another, that people matter – and sometimes they matter a lot.

The diffusion of social networking practices and growing use of mobile technologies – notably social media for personal or political uses – has further reinforced the potential power of entities other than the state. All of this affects the nature of the international system – structure, process, and participation – while shaping an emerging and rapidly growing global civil society that transcends traditional territoriality and sovereignty.

This Workshop focused on six questions:

- What has changed, if anything, for people power and global politics?
- How do we listen to messages?
- What are the new threats and opportunities for governance?
- What are the impacts of cyberpolitics on democracies?
- What can we learn from experience on social media and social action?
- Are there new visions for the future?

This ECIR workshop is the second in a series of sustained deliberations and explorations involving leading individuals in academia, government and business. The result of this workshop provides a baseline for an evolving understanding of people, power and cyberpolitics. The ECIR Project seeks to develop a new multidisciplinary field of scientific inquiry to provide the theories, tools, and modes of inquiry relevant to unprecedented, new, complex, and rapidly changing conditions created by the construction of cyberspace.

1. People Power & Global Politics: What has Changed?

The balance of power is shifting from the West to the East. The primacy of the Western powers is being challenged by a ‘diffusion of power’ over a variety of states (east/west, developing/developed) and to a variety of non-state actors (traditional and cyber) – all enabled by technologies which flatten hierarchies and create more network-like structures. Information Communication Technologies (ICT) and the lower barriers to access to these ICT tools for use in political action have caused a fundamental shift in the future of ‘power’ – and the study and analysis of it. The under-rated but very important impact of social media’s ability to carry video messages is an example. The connections between those people who are on social media inside repressive
regimes and the diaspora community outside of the country are an important element in the role of social media in civic activities. There is a growing, central tension between transparency and accountability – as different ICT technologies and platforms are subjected to a variable degree of control.

Research priorities include a focus on the negative aspects of social media platforms and their impact on democracy, the potential misuses of technologies by states for surveillance, and the threat to the Internet by authoritarian governments. Communications through social media can move at an extraordinary speed to get the story out and coordinate action.

2. How do we Listen?

What happens when people get bad, irrelevant, or unimportant messages? There are large differences in rejection rates of partisan rumors by partisans, but not on non-partisan rumors. Direct contradiction works well in the short term, but people don’t retain that, because of more familiarity with the myth than the counter-evidence.

People have been communicating all the time but the notion of privacy has changed. For example, social media posts have cut into email traffic and made it public. The young have a broadcasting capability, and the consequences are unknown.

Opinions of activists now number in the millions of political opinions spread globally by ICT on a daily basis. Various Social Language Processing techniques can be used in the strategic analysis of individual speeches or large collections of social media data. Three issues are relevant to “how we listen:” (a) The explosion of data – finding answers in the explosion of data is difficult, (b) Research methods – basic vs. rather abstract models with practical applicability are important, and (c) Quality of translation – different sets of methods can be applied to the original language or translated language; human language is incredibly subtle.

There are enormous, emerging social science opportunities ahead – representing a historical shift from studying to understanding and solving big societal issues and problems. Social scientists do not care about the needle in the haystack (individual document classification); they care about the haystack (category proportions).

3. What are Threats and Opportunities for Governance?

The fundamental difference of the Internet from other communication mediums is in changing attitudes and getting people to act. It is affecting the propensity of people to act during a coup or conflict. The source of credibility of the information and the fact that the sheer amount of information and images can sometimes quickly contradict one another can impede action.

There are two generic ways of conceptualizing the effect of communication on the individual: (a) through a change in attitude, and (b) through a propensity to act on your attitudes. The propensity to act on one’s attitudes can be influenced by the low barriers to entry. Given the increasing transparency in our lives, both positive and negative, government is both a dis-intermediary and an intermediary. The matter of publicity turns the conversation to the notion of information that is not
necessarily hidden by a government, but information that a state actor is not anxious to make public.

4. What are the Impacts of Cyberpolitics on Democracies?

Four hypotheses help shape the discourse:

- **Analogical thinking hypothesis**: some of the thinking in the field of politics and technologies tries to draw the analogy between the experience of technology and the technological domain. There is a plausible reason why this hypothesis is wrong: a fundamental difference in demand.
- **Disintermediation hypothesis**: large organizations are less relevant because they reduce the organizational friction and coordination costs.
- **Public sphere hypothesis**: allows more people to communicate, reducing the domination of the public sphere by capital and capital equipment.
- **Transparency hypothesis**: make information more available, more credible and legitimate.
- **Organizational amplification hypothesis**: amplifies the functions of existing organizations gradually. Social media may allow for the sharing of this knowledge – which misses the fact that there are resources necessary for collective action in addition to information.

Methods are being developed for individuals to voice their dreams and articulate their ideas about how society should operate. The role of social media and its use by activists in relation to government control is important. However, it is one of the tools in political activity or used with the knowledge of being monitored. This means that communications are adaptive.

Two additional issues address broader processes: (1) **Social media mobilization theory**—the basic premise is that it just takes a click of a mouse to use a mobile phone is suspect because the ability of a government to shut down a system in the moment of political turmoil is unprecedented. (2) **Attention thesis**—Facebook is thoroughly monitored by state actors; and media is posted, translated and made available to media organizations by ‘bridge bloggers’ who then broadcast it; (i.e., Al-Jazeera).

5. What can we Learn from Experience?

We now know that the future is not just about technology – but about socio-technology. Authoritarian regimes have realized the power and danger of social media. As a result, censorship is being stepped up. The challenge ahead is that while we can generally agree with current causes taken up by those activists, we are arming with these subversive cyber tools: what happens when we don’t agree with what they do?

The issues of risk (i.e., personal risk), relationships and the role of the Internet become salient. The Internet lowers the cost of communication and the ability to penetrate networks and increases the number of weak ties available to activists. Social media accelerates the spread of information and its penetration of strong tie networks. In questioning why there is an assumption that the Internet
creates only weak links, findings indicate that an activist will show up with his or her brother rather than someone he or she is friends with on Facebook.

The mainstream media enhanced the credibility of social media content because television broadcasts acted as quality control. For example, social media did not cause the Egyptian uprising, but it did impact the complex networks through which it occurred. New technologies are being developed to connect with the world of policy makers.

6. What will the “Next Generation” of Challenges Bring?

There is something very powerful about the Internet, even though the mainstream experience is trivial. At least three visions of the future can be identified:

Vision 1: The Future is one with more offense and defense

There are important fallacies in the study of cyberspace – namely, that the environment is reactive and that, in principle, a bordered Internet is in fact possible. The dominance of ‘offensive postures’ in cyberspace is largely true. Offense beats defense in cyberspace. If we cannot do good offense, we cannot do good deterrence – which leaves a circular state of affairs. There is a strong offensive orientation in governmental thinking. Despite the systemic difference between autocratic and democratic governments, both types of government are moving in the direction of being more suppressive.

Vision 2: The Future is created by us today

The more important question is this: who is driving the future of the Internet? The domain name system (DNS) is going to be a contentious area regarding control because of the ability to control the user’s experience. In short, we must buy the future we want. Those who are funding the future are also heavily involved in the design process. We should be asking, “Who should be shaping the future Internet design?” In a mutual aid framework, it is a question of what granularity, how big the group is and whether the countries would be willing to pay.

Vision 3: The future depends on emerging technologies

The baseline design of the Internet was one of decentralization both from a technical point of view and from a political point of view. That baseline is rapidly changing, with the rise of centralized applications such as Twitter or Amazon. We must figure out how to take a politically charged matter and make it an engineering matter (or a technical problem). There is an abject need to focus on the ‘future of technology’ as well as the ‘changes in society brought on by technology.’ It is important to identify where the points of tectonic shifts are in the technology space.

End Note

This Executive Summary represents the general “state of the art” as seen by the Workshop participants. It also provides something of a baseline against which to track future developments. The discussion points new relevance of people in international relations, potential changes in power distributions, and emergent complexities for cyberpolitics. As we move forward, we must
address the following questions: Who controls cyberspace? What are emergent forms and uses of social media that influence—enable or impede—how people-power unfolds over time? What are the emergent contours of cyberpolitics? How will these affect power relations worldwide? There are many more questions, to be sure, however, these are among the most pressing.
Acknowledgements

I would like to express my appreciation – and that of the entire ECIR Research Team – for the assistance and contributions of the following individuals in the preparation of the Workshop Report: Mark Finlayson, Shirley Hung, Jessica Malekos-Smith, Tim Maurer, Patricia McGarry, Vivek Mohan, Larry Pang, Daniel Pereira, Aadya Shukla, Michael Siegel, Jesse Sowell, and Chintan Vaishnav. Special thanks are due to Elizabeth Nigro for her contribution in the integration of the various parts of the Report into a final product.

This work is funded by the Office of Naval Research under award number N00014-09-1-0597. Any opinions, findings, and conclusions or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the views of the Office of Naval Research.

Nazli Choucri
INTRODUCTION
Nazli Choucri
Political Science Department, MIT

New Reality

For the first time in human history such a large number of people from all parts of the world participate in a new arena of information and communication of global scale and scope. Almost everyone everywhere has the opportunity to participate in cyberspace. Few states, if any, are able to control the flow of information via cyber venues that cross their boundaries. All states are recognizing, to one degree or another, that people matter – and sometimes they matter a lot. This reality is also influencing the changing power distribution in international relations. The “old” concentration of power in a bipolar cold war world has been replaced not by multipolarity but, more importantly, a “new” international structure characterized by the diffusion of power.

New Complexity

In the “new” world people also matter in a particularly unprecedented way. The age distribution of the global population is skewed toward the young age groups. And everywhere it is the young people that dominate participation in cyberspace. More and more, the diffusion of social networking practices and growing use of mobile technologies – notably social media for personal or political uses – has reinforced the potential power of entities other than the state. All of this affects the nature of the international system – structure, process, and participation – while shaping an emerging and rapidly growing global civil society that transcends traditional territoriality and sovereignty.

New Challenge

A critical challenge at this time is that the organized fields of knowledge do not provide a sufficiently robust basis for analyzing, anticipating, and responding a new way of understanding power, politics, the state, and institutions of governance: nationally and internationally. The goal of the ECIR Project is to develop a new multidisciplinary field of scientific inquiry to provide the theories, tools, and modes of inquiry relevant to unprecedented, new, complex, and rapidly changing conditions created by the construction of cyberspace.

Workshop

This workshop is the second in a series of sustained deliberations and explorations involving leading individuals in academia, government and business. The outcome of this workshop will provide a baseline for evolving understanding of people, power and cyberpolitics.
Introduction: People, Power, and CyberPolitics

Nazli Choucri

Massachusetts Institute of Technology, Department of Political Science

People, Power, and CyberPolitics

- People
  Almost anyone can participate in the new domain
  Everywhere young people dominate cyber access & participation
  Explosion of social media reinforces power of people
  People are acting, challenging the state

- Power
  The state is faced with new and unexpected pressures
  Changes are happening faster than the ability to fully track
  Emerging and growing influence of civil society

- CyberPolitics
  Changing demography of cyberspace
  Use of power in traditional venues to influence cyber domains
  Use of power in cyber venues to influence traditional domains
  The added power of anonymity

The Workshop

- Participants with diverse background, training, interests, and perspectives
- Agenda focused around a set of initial questions – to bring out differences of views
- Few assumptions, but framed around overarching issues, such as:
  - Are the new realities transient or transformative?
  - What do we know? what do we not know? what should we know?
  - What are major research and policy imperatives?

At the End of the Day

- Better understanding of how, when, and why people, power and cyberpolitics shape realities on the ground
- Baseline of issues, contentsions in theory and practice
- Assessment of what we might be missing
- Priorities for research and policy – nationally and internationally
- Potential networks of Workshop participants with shared interests
- Illustrations of the next generation research

Expect the Unexpected
I. People, Power and Global Politics: What has Changed?

Framing Questions

How do people matter in international relations?

How does context matter? How does social media matter?

What are the impacts on the development of the 21st C. world order?

How are these issues relevant to foreign policy and national security?

What are major research challenges?

Panel

Moderator
Joseph S. Nye, Jr., Harvard Kennedy School

Panelists
Robin Staffin, Office of the Assistant Secretary of Defense for Research and Engineering
Gordon Smith, Centre for Global Studies, University of Victoria, Canada
Adam Segal, Council on Foreign Relations, New York

Presentations

Joseph S. Nye, Jr.

Traditionally, political science views the state as the central node of policy and decision-making. As a result, the state has become the primary analytical unit of the political scientist. This has led to less of an analytical focus on civic engagement and/or political action by ‘the people.’ Information Communication Technologies (ICT) and the lower barriers access to these ICT tools for use in political action have caused a fundamental shift in the future of ‘power’ - and the study and analysis of it.

A few forces have contributed to this shift. For one, the balance of power is shifting from
the West to the East (see Adam Segal’s books *Advantage: How American Innovation Can Overcome the Asian Challenge* and *Digital Dragon: High-technology Enterprises in China* as vital works for gaining an understanding of how China specifically adopted a wide array of policies designed to raise its technological capability and foster industrial growth). Secondly, the primacy of the Western powers is being challenged by a ‘diffusion of power’ over a variety of states (east/west, developing/developed) and to a variety of non-state actors (traditional and cyber) – all enabled by technologies which flatten hierarchies and create more network like structures.

Technology as the driver for a power shift is not a new phenomenon. It is how this change is currently manifesting which needs to be looked at differently. For example, Johannes Gutenberg’s printing presses led to numerous cultural changes, including the Protestant Reformation. This may not be the appropriate analogy, however, for the power shifts that we are currently witnessing. The new patterns of civilization we are seeing, including the creation of new values in the market economy and political action in the public sphere, are more analogous to changes that occurred around the feudal state in the Middle Ages.

Medieval merchants developed the ‘*Lex Mercatoria*’ (Merchant Law) to go about their business without replacing the feudal state laws in Italy. The feudal system was not replaced overnight. Rather, it was transformed slowly by a constant flow of accretions, additions and new systematic and structural layers. The *Lex Mercatoria* did not displace the medieval castle but grew around the castle. What are the ways the contemporary power shift will manifest in similar additive, subtractive and layered process?

It would be a mistake to view the situation as binary. The non-state actors are not supplanting the State. Instead, the stage on which actors vie for power is becoming more crowded with a plethora of organizations and individuals. Individuals are now able to play new roles (i.e., – new third actor in Egyptian Politics via the civic force displayed in the public square).

The dynamics of actor-actor interaction are also changing. Controlling anonymous groups of non-state actors, backed by technology, is fast becoming a dilemma for the state actors. The number of transnational actors is also increasing. Non-state actors (hackers or large corporations) are defining their own set of norms outside the control of state actors to conduct their business. New international political structures are emerging, structures that are no longer simply comprised of two parties but various three or multi-party equations are emerging.

The MIT/Harvard ECIR research community must address the following two questions. First: What is the impact of these power shifts? And, secondly; How do various stakeholders speculate about this change?
Robin Staffin

“I know why you’re here, Neo...I know what you’ve been doing, why you hardly sleep... It's the question that brought you here. You know the question, just as I did.” …The Matrix

We are brought here to this panel discussion by the question, “what is the changing nature of Cyberspace and of Internet itself.” It is a fitting question to address at the institution that played such a major intellectual role in development of cyberspace. It is also significant in the context of the joint MIT-Harvard project, “Explorations in Cyber International Relations (ECIR),” which is cosponsoring this symposium. ECIR is a major project under DoD’s Minerva Program.

Initiated by the Department of Defense in 2008, the Minerva program seeks a deeper understanding of the social, cultural, and political dynamics that shape regions of the world of strategic interest, and their impact and interaction with modern technology. It is a gigantic challenge getting one’s arms around such a broad set of forces and trends, but it is important that we attempt to do so, since societal and cultural environments define much of the context of our national security posture.

It is also not easy in this particular case to see this challenge of cyber with clarity because of the varying world views and perspectives on cyberspace. Cyberspace challenges are highly interdisciplinary, and this is another reason why we are all here.

A cautionary tale from the early years of the World Wide Web that relates to the wide reach of internet communication: High energy physicists are generally credited with the creation and early development of the Web, driven by collaboration needs for rapid, global communication of data and analyses. Well, it so happened that an enthusiastic few would on occasion communicate their 'take' on fresh scientific data by personal blog. They didn't realize that scientific reporters also read their blogs and would use this as source material, giving them an early window into possible major discoveries, such as for the search for the long-sought Higgs boson. The irony here was that it was this same scientific community, the early inventors and developers of the web and its tools, would also be one of its earliest victims. What are the implications of such public/private sector data, collaboration and data issues moving forward?

Gordon Smith

Given that the distribution of power is being diffused, there is a need to focus research on new forms of civic engagement and new media - especially the role of social media platforms like Facebook and Twitter to support the “uprisings” in the Middle East.

The noted role of social media in these uprisings should not be overestimated. Some people are exaggerating the role of Twitter and Facebook, while others falsely dismiss their influence. It is important to focus on one pivotal question: Which social media platform
The insights of work by MIT Researcher Ethan Zuckerman are important, specifically the recent interrogation of what caused the self-immolation video of the vegetable seller from Tunisia to be spread so instantaneously – and what were the mechanisms behind its rapid spread across the globe? The self-immolation by the man in Tunisia was not the first such act. Key to its spread was its accessibility to people outside Tunisia and their ability to take further action. Social media can move at an extraordinary speed to get the story out and in terms of coordinating action. The under-rated but very important impact of social media's ability to carry video messages – especially if the video URL is embedded in Twitter is an example.

Social media has now created a perception and/or proven that “the people” can bring down even the worst tyrants. As Marc Lynch noted, the ‘wall of fear’ has been shattered. The challenge now is for research in the area of how social media can contribute to the implementation phase or the building phase of a democracy. The role of diaspora communities in responding through Internet activity to events or political actions in other countries is important. Connections between those people who are on social media inside repressive regimes and the diaspora community outside of the country are an important element in the role of social media in civic activities (such as repackaging reportage for pick-up by traditional media) is very vital. The role of the curators of social media is becoming increasingly important.

The following proposition must be tested: how important is social media going to be in this building process?

Huge quantitative social science research opportunities exist. These include smart phone penetration metrics, for example, with their capacity to bear witness through video on smartphones. Or we can look at the Tahrir Square’s tweets as a percentage or share of votes for the Muslim Brotherhood and Salafists.

The negative aspects of social media platforms and their impact on democracy, the potential misuses of technologies by states for surveillance and the threat to the Internet by authoritarian governments must be studied. Governments can also use social media to monitor its people and misrepresent the facts. A remark from the audience drew attention to the fact that with the social media it is impossible to hide. It is important for the government to strike a balance between anonymity, privacy and cyber-security threats (i.e., crime), but that remains one of the biggest challenges.

It is evident that ICT has facilitated the rise in civic engagement and the power of people – but more research must be done to understand the distribution of this power across the spectrum of new technology platforms. While there is a groundswell in bottom-up, participatory political actions, the ever-increasing importance of the top down structures and the annual conclaves of political and economic elites and state actors remain.
Adam Segal

There are multiple types of coalitions and ‘spaces’ within cyberspace. These spaces are very different and various. Cyberspace has to be broken down, classified and taken apart. The work by Ethan Zuckerman and the role of “bridge bloggers” is not only bridging between cultures and languages, but between different coalitions and spaces in cyberspace. This process is not a zero sum game but one of slow accretion from the power of the state to the power of the people.

There is a growing, central tension between transparency and accountability Salafists. as different ICT technologies and platforms are subjected to variable degrees of controls. There is a need to analyse the behaviour of various actors over the Internet, the changing dynamics of actor-actor interaction in China, as the Chinese government is currently listening to debates by citizens. Contrary to the popular view, this debate is not leading to any kind of uprising among activists in China. Instead, it is a demonstration of the fact that ICT has forced the Chinese government to think about accountability and transparency concerns as a way of increasing citizen’s trust in the state.

The future of the Internet is probably not American but Chinese. There are 500 million Chinese online with potential for another 700 million to go online in the years ahead. Chinese hackers are influencing international politics as non-state actors. There are new types of coalitions and themes promoted by the Chinese governments in an effort to influence, shape or set global norms in cyberspace. China is also able to influence international politics with a presence in Tunisia and Middle East/North Africa and is involved in managing the Internet with its set of norms. For example, China is currently sending ICT experts to countries with lower ICT capabilities. China is providing its surveillance technology equipment and therefore pushing its own set of competing standards in the technology domain. At a recently held conference in London (November 2011), the Chinese government tried to get its guidelines for the International Code of Conduct accepted.

Projects like Minerva underlined the value of interdisciplinary research by institution happening by way of student and researcher engagement across the discipline boundaries.
Open Discussion

Multidisciplinary Research

How do you get interdisciplinary research from universities and overcome institutional barriers?

- Multidisciplinary university research initiatives are trying to create research that is more than just the sum of its parts.
- Work in the 1970s on transnational relations and influence of sociologists and economists on work, an outstanding example is the Munk Center at the University of Toronto.

Data and politics

There is now more data on more people, i.e., in parallel to the Arab uprising, also economic protests in Tel Aviv with data available through cell phones. Can we keep up?

- It is possible to measure certain factors but the challenge is to reveal causal relations between those factors and changes in politics.
- Some literature presents founders of www as political actors and while that is true for some of its architects there were also some political radicals with a particular political agenda.
- Facebook and Google were created without deeper political aspirations but it was Twitter and its founder Dorsey which realized that it could be for political purposes.
- In the Arab uprising governments shut down profiles on social media platforms, crucial role of private companies.

Social Learning

How do actors succeed or fail to learn?

- Learning in government is splintered.
- Simulation gaming potential to get people in government to talk.
- Learning by activists, example of Syrian activists.

China brought in experts from all over the globe on particular issues to then learn lessons from these experts

- Chinese government strategy is to control social unrest, to deploy lots of police forces in key locations but potential internal challenges because the degree to which Chinese system is stove piped.
- Since 1978 onwards, Chinese government has been trying to learn, from outside models and actors, in this rapidly changing world of technology.
Lumpy and discontinuous learning in government is often due to external events (article in Strategic Studies on learning from nuclear domain)

- Impact matrix can be established by developing methodologies (for example, network analysis & system dynamics modelling) to assess three aspects: what people are doing, how they are doing it and if they are acting within the boundaries of ethical behaviour.
- ICT leads to collective actions – from people to group levels.

The State

- States have the monopoly on the use of force.
- Weber stated states have monopoly on legitimate use of force.
- Weber’s definition defines the problem away.
- The question of monopoly of state power will be clarified only after norms in cyberspace have become more established. Before that, we can kick the can by sticking to the conventional definition of power (as monopoly on power is upheld by the state assuming legitimate usage of power).
II. How do we listen: new ways to analyze the messages

Framing Questions

How do different parties (groups, states, etc.) listen, interpret and react to messages?

How effective are the different parties at framing, collecting, accessing, or distributing messages?

How do messages from one group (or constituency) affect the responses, activities, or messages of other parts groups (or constituencies)?

What new research provides added insights on these issues?

Panel

Moderator

Michael Siegel, Sloan School of Management, MIT

Presentations

Gary King, Department of Government, Harvard University
David Beaver, Linguistics Department, University of Texas at Austin
Adam Berinsky, Political Science Department, MIT

Presentations

Michael Siegel

In 2005, Siegel (along with Stuart Madnick, Nazli Choucri, John Mallery, Daniel Goldsmith and others) began a Defense Advanced Research Projects Agency (DARPA) contract looking at state stability and insurgency. At the time, they provided a definition for stability involving loads and capacities. Through the contract, they developed models of the relationships between dissidents, insurgents, governments, etc. Part of the result was the realization that the state did not get to the insurgents early enough - and that “teasing” them back into the population is a low-cost way of maintaining stability.
The research provided a significant improvement over the understanding of insurgencies. But states remain the dominant actors; what is new, though, is the speed of communication. This led to a focus on the role of cyber venues, either by dissidents or by states. Several cases were done that both supported and contradicted the hypothesis that cyber was important to this model of insurgency. This work led to integrating cyber into our insurgency model. Several of these factors were about the intensity, circulation rate, and effect of messages.

*Slides at the end of Session II.*

**Gary King**

The workshop has so far been concerned with the effect of the massive changes in technology on politics, society, and so forth. It is not clear what the effect of 'big data' will be on politics, but the real big change that can already be measured is the enormous effect the data revolution is having on social science research. It represents an historic change in the field of research if there is shift from simply studying phenomenon to actually getting to the point where the problems identified previously in the workshop can be addressed and potentially solved.

The evidentiary base of social science has rapidly expanded. In the last 50 years, there has been an explosion in surveys, aggregate government statistics, in-depth studies and other forms of datasets. In the next 50 years, we will see a similar explosion of data, in addition to innovations in academic data sharing and the data replication movement (e.g., Dataverse⁴), government e-records and sophisticated statistical methods. This continuing “march of quantification” is the official end of a quantitative-qualitative divide in the social sciences and humanities. It is a very exciting time in social science research.

Opinions of activists (which would have numbered hundreds or thousands of interviews in a field research context) now number in the millions of political opinions spread globally by ICT on a daily basis. At last count, one billion tweets are now generated every 4 days.⁵ Another example cited are surveys generated by surveying 500,000 people carrying accelerometers in cell phones to measure exercise. This approach allows an understanding of the social context by using the continuous record generated by each individual. In the area of economic development, satellite images of night-lights, roads and farms are used for research purposes.

Social scientists do not care about the needle in the haystack (individual document classification), they care about the haystack (category proportions). The individual “tweet” of the individual user is not of interest to the social scientist. For example, biological sciences are becoming social scientists with the same unit of analysis (the human being) but thousands of variables and patterns of the 2,000-3,000 similar observations.
A new research project focusing on automated text analysis is used to read billions of social media posts to understand blogosphere opinions of presidential candidates. An example of an application in politics was the reaction to a botched joke by presidential candidate John Kerry. Political strategists were able to see an obvious reaction to this event instantly in the blogosphere. Commercialized in 2008, the product that evolved from this initial research effort is now called Crimson Hexagon and continues to collect data from all social media posts.

An example is the recent development of a new method, Unbiased Category Proportions. It was then applied to Chinese blog posts (at least the posts which ones were not taken down by the government). Other types of data such as unstructured text (emails, speeches, blogs, newspapers, etc.), commercial activity (credit cards, sales data, produce RFIDs), geographic location (cell phone, GPS), health information (digital health records), biological sciences (genomics, brain images), satellite imagery (electoral activity, social media, web artifacts and multiplayer games/virtual worlds) all hold potential for quantitative research in the social sciences.

The central point is this - there are enormous, emerging social science opportunities ahead - representing an historical shift from studying to understanding & solving big societal issues and problems. If you are interested in exploring opportunities and areas of collaboration, see http://gking.harvard.edu.

Slides at the end of Session II.

David Beaver

A major research effort has been started by the Linguistics Department at the University of Texas at Austin and the Department of Psychology at the University of Memphis in Social Language Processing, specifically Linguistic Inquiry and Word Count (LIWC).

LIWC is the statistical analysis of texts and the use of specific word types e.g., pronouns or the use of first person pronouns. The research is using LIWC as it relates to deceptive behavior. A few examples of LIWC results include; academically successful college students used more nouns in their admissions essays than less academically successful students. Another example of a result derived from LIWC research is tracking positive and negative emotion words around the events of 9/11. The research reflects a prolonged period of positive emotion after three days of extraordinary negative emotion.

Coh-Metrix is a set of tools to analyze text coherence and the narrativity of text. The tool is able to illustrate that people get more coherent when they tell a story. For example, is there coherence to the speeches of Egyptian President Hosni Mubarak? And how do the speeches map to the events in Egypt over the last 30 years? Coh-Metrix can also be applied to the tweets of the Egyptian revolution or the Libyan revolution – revealing such characteristics
as the volume and temperature; emotion, positive, negative, anger, religiosity and violence present in the coherence and narratively of the text.

Other tools include Latent Semantic Analysis (LSA), topic models and machine classifiers (e.g., Google search or spam filters using machine learning techniques). The use of linguistic analysis does not tell you what is happening but it does reveal that something is happening - giving clues about potential escalations. Social Language Processing techniques can be used in the strategic analysis of individual speeches or large collections of social media data. Automated analysis reveals patterns mirroring independently identified historical events. Every organization or nation leaks massive amounts of text. Social Language Processing converts this information glut into psychologically, socially and politically significant data.

*Slides at the end of Session II.*

**Adam Berinsky**

What happens when people get bad, irrelevant, or unimportant messages - and what can be done about it?

Take the example of the “Birther” debate surrounding Obama’s U.S. citizenship. Google trends on this topic show two big peaks: one in 2008 around the election, one in 2011. Part of the research is to understand why, again in 2011, people became really interested in this topic.

Survey methods were used to investigate these beliefs. In July of 2010, the Polimetrix survey showed only half of those surveyed say “yes” to “Do you believe Obama was born in the U.S.?” The research also focused on rumor rejection rates.

Other examples include Kerry’s alleged lies about his Vietnam service; Rumors that the FBI and CIA steadily supply guns and drugs in the inner city; 9/11 “Truther” question; and Roswell extra-terrestrial spaceships. Significant portions of the population believe these examples. Indeed, the general result is that 75% of the population believes something crazy about something and, as a result, are susceptible to rumors. There are large differences in rejection rates of partisan rumors by partisans, but not on non-partisan rumors.

So how do we get people on the right track? How do we get them to reject these rumors? Rumors are sticky – once they are out there, it’s hard to get rid of them. There is a classic WWII study of the widespread rumor that U.S. Japanese internment camps were “pleasure jaunts.” One option as a response: direct contradiction. An example is the debunking flu vaccine myths. Direct contradiction works great in the short term, but people don’t retain that, on the basis of more familiarity with the myth than the counter-evidence.
There is an example of a potential solution taken from a study of the health care “death panels” and rumors taken from actual quotes. One control mechanism is to provide correcting evidence (this shouldn’t work). The study then corrected for the partisan aspect by providing a Republican or Democratic quote. So four conditions emerge for the examination of the belief in the rumor (or the rumor rejection rates). Following are the results:

- Control: 47%
- Rejection, rumor only: 46%
- Rejection, rumor correction: 57%,
- Republican correction: 63% (Democratic correction: 56%).

Providing a corrective from a Republican, to republicans, for this Republican-focused rumor is the most effective rumor debunking strategy. Of course, the effect decays over time – a week later, all corrections are less effective.

*Slides at the end of Session II.*

**Open Discussion**

**Changes in Communication Contexts**

*How ephemeral are emotions expressed in tweets? Also, the deep institutions of organizations are influenced by their rumors.*

- People have been communicating all the time but that notion of privacy has changed, for example, social media posts has cut into email traffic and made it public and the broadcasting capability given to users.
- The big change is not just tweets. People have always communicated. It’s just too large numbers of emails. Our conceptions of privacy have radically changed. Emails are private, but not blog posts and now blogs are greater than email. So our conversations are public. Thus, the young have a broadcasting capability, and the consequences are unknown.
- We have a basic change that we have low-cost access to information.
- There is a solid finding that even a false belief does not last very long. There is an experiment on an issue where people select their own media types. What’s going on in the information environment? There’s no difference in the way of transmission; it’s only whether or not they got correction.
Explosion of Data

There is a concern regarding explosion of data and the differentiation between fact and noise as well as the question of outcome. The real challenge is how to understand how the outcome is influenced by their causal relationship with behavior or action online.

- Finding answers in the explosion of data is difficult. But we can now measure opinions extremely accurately. We can do some of these things extremely well. We don’t have measures of the outcome yet. So the problem is not that the data aren’t good enough, it’s that we don’t have enough data. Opinions are now expressed very accurately and there are techniques to analyze the new data and measure it but no measures for the outcome.
- The commercial sector is not doing the analytics that we think they might be doing to understand what the outcome is. They collect the tweets or blog posts and show those directly; they do not do long-term correlations with sales, for example. They have access to all sorts of data, but are not using it well. It is important to analyze the data in depth and over time and not to simply face the amount of data.
- There are some cases where we do have the outcome. Hedge funds, for example, which try to mine tweets to play the market. However, it doesn’t work. We want to know: can you be wrong? Compared with the truth, how often are you getting it right. It’s easy to do post-hoc analysis, to look at your temperature plot and label important peaks.

Rumors

Is there evidence of governments or political organizations using rumors to further their cause? Using social media to stir things up?

- It is difficult to say if government is using it for misinformation but government is using techniques to analyze data. We don’t have current data on that. But sentiment analysis is big commercially. Government is also using these analyses, just to find out if the message is getting through.
- NGOs are important too.
- Most political campaigns use rumors. The difference now is not that they're trying to manipulate opinions, they get instant feedback, they don’t even have to wait overnight for a poll. They need to get better, though. Political campaigns have used rumors in the past but the difference today is that there is immediate feedback.
- How Obama has reacted to the birth certificate controversy is an example, it’s not just about speed, it’s about strategy. There is a team, which consults with the White House, and the thought was not to confront it but to avoid giving it legitimacy. Considerations and impact of direct engagement, and the like dominated. It is very hard to counter these rumors.
How good are you at predicting whether a rumor will catch on?

- There is lots of work on this. Level of disgust and anxiety are good predictors. More emotionally engaging rumors make people more likely to spread them. Many industrial organizations work on this.

Opinion and Social Media

When looking at how widespread an opinion is, how do we correct for intensity of belief? How are users of social media different from users of email? Are we almost measuring the same thing?

- It is an important theoretical question of whether to count everyone equally or based on various qualifiers.
- We are not measuring the same thing; we are measuring the expressed opinion. We are looking at whoever speaks, but you may not want that. One may want a truly random sample. One may want to look at intense expressions. There are many ways of approaching opinions.
- It depends on how the story is being told and what is highlighted, so there is a variety of factors that create quality of rumors e.g., emotions such as anxiety or disgust increasing the likelihood of the rumor being spread.

Probability

Can Bayesian priors be explored?

- Any predictive analysis will eventually be self-defeating because everyone will do it.
- If we would get a telescope that is 10,000 times better than any telescope we currently have, what would we know on the first day? Probably very little, because we do not know what we are seeing until we have invested time to analyze it. On the first day, we wouldn’t know what we were looking at. But we would get there. We are on the first day.

Research Methods

In discussion with other scientists, some stated that what Minerva is doing is not basic research but specific research; are we too much captives of our own disciplines? But physical scientists say this is not basic research – you’re studying particular countries at a particular time. Question: Are we applying the incorrect categories to this field? Should we move to less of a distinction between basic/applied?

- The big change that is happening is that a social science office today includes the PI typing away on code; in physical sciences, they have whole buildings and labs to do that for them. But there is a lack of resources to analyze the new data and therefore necessity to collaborate with others but other disciplines might not
have similar interests in topic or type of questions. Basic vs. applied may not matter very much but rather abstract models with practical applicability are more important, it won’t be built in the same way as the physical sciences; it will be different. The ones that are most productive are the ones that start on the basic side and run all the way to the applied end.

Translation Issue

How important is quality?

- Different set of methods that can be applied to original language or translated language; human language is incredibly subtle no matter what algorithm you come up with, you can come up with an example, which will break it. It is often repeated. How much of a person do you need to listen to determine if they’re vitriolic? We use the repetition, and try to avoid the pitfalls created by the subtlety. We have to be sensitive to the quantity we are trying to estimate.

- To what extent is noise and bias a particular method introduces? Different errors created by translation checked by native speakers as well as differences regarding size of error with regard to positive and negative sentiments. You have to measure the error. For the tweets, the positive and negative ones have different error rates.
How Do We Listen: New Ways to Analyze the Messages
Michael Siegel
Sloan School of Management, MIT

How do we listen? New ways to analyze the messages

Presentations:
- Gary King
  Department of Government, Harvard University
- David Beaver
  Linguistics Department, University of Texas at Austin
- Adam Berinsky
  Political Science Department, MIT

Discussant:
Michael Siegel
Sloan School of Management, MIT

State Stability

The stability of the state is a function of the relationship between the loads (or pressures) on the system, and its capacities (or power) to manage these loads.

Loads
- Insurgents
- Discontent
- Protests
- Violence/Incidents
- Negative Messages

Capacities
- Regime Legitimacy
- Economic Performance
- Social Capacity
- Political Capacity

Changing Dynamics

"States remain the dominant actors on the world stage, but they are finding the stage far more crowded and difficult to control.

What is new — and what we see manifested in Egypt today — is the speed of communication and the technological empowerment of a wider range of actors."

— Joseph Nye, Jr. 2011

Role of Cyber?

Insurgency and State Stability

Cyber Cases

Regime Change
- Philippines 2001: Recognition of President Joseph Estrada. The protest was arranged partly by forward-thinking religious reading, "The Satanic Verses."
The crowd quickly swelled, and in the next few days, over a million protesters converged, causing police chief to surrender
- Spain 2004: Demonstrations organized by the((messaging and the blogosphere of Gdansk. Prime Minister José Luis Rodríguez Zapatero, who had previously learned the tactics of bombings, was faced with demands.
- Moldova 2009: The Communist Party lost power after massive protests coordinated in part by text messaging. Facebook and Twitter helped stir up an socially Facebook election.

No Change
- Belarus 2006: Street protests (supported by the Internet) against President Alexander Lukashenka. The protests, however, were stopped, leading Lukashenka to more determined than ever to control social media.
- Iran 2009: During the June 2009 uprising of the Green Revolution in Iran, authorities used every possible technological coordinating tool to prevent the momentum of protests for Mir Hossein Mousavi, but were ultimately brought to heel by a violent crackdown.
- Thailand 2010: The Red Shirt uprising in Thailand in 2010 followed a similar but broader social media occupied protest strategy, but the government dispersed the protest after killing dozens.

Does it Even Matter?

People, protected and brought down governments before Facebook was invented. They did before the Internet was invented. Nearly anyone in East Germany in the nineteen-eighties had a phone. People with a grievance will always find ways to communicate with each other. How they choose to do it is less interesting, in the end, than why they were driven to do it in the first place.

For [Shirky],...to be anything close to persuasive, he has to convince readers that in the absence of social media, these uprisings would not have been possible.

— (Shirky, 2011)
The Social Science Data Revolution
Gary King
Institute of Quantitative Social Science, Harvard University

The Social Science Data Revolution
Gary King
Institute for Quantitative Social Science
Harvard University
(People, Power, & CyberPolitics Workshop, MIT, 12/6/11)

The Changing Evidence Base of Social Science Research

The Last 50 Years:
- Survey research
- Aggregate government statistics
- In depth studies of individual places, people, or events

The Next 50 Years: Spectacular increases in new data sources, due to...
- Much more of the above
- Shrinking computers & the growing Internet: data everywhere
- The replication movement: academic data sharing (e.g., Dataverse)
- Analogue-to-digital transformation of government records
- Advances in statistical methods, informatics, & software
- The march of quantification: through academia, professions, government, & commerce (Super Crunchers: The Numerati, MoneyBall)
- The end of the quantitative-qualitative divide

Examples of what’s now possible

- Opinions of activists: ~1,000 interviews → millions of political opinions in social media posts (18 every 4 days)
- Exercise: A survey: “How many times did you exercise last week?” → 500K people carrying cell phones with accelerometers
- Social contacts: A survey: “Please tell me your 5 best friends” → continuous record of phone calls, emails, text messages, bluetooth, social media connections, electronic address books
- Economic development in developing countries: Dubious or nonexistent governmental statistics → satellite images of human-generated light at night, or networks of roads and other infrastructure
- Many, many more...

How to Read Billions of Social Media Posts


- Downloaded & analyzed all English-language blog posts every day.
  (We learned: The university is not a research, not production, environment!)
- Commercialized in 2008:
- CH collects all social media posts, runs huge servers with our methods
- Crimson Hexagon Academic Grant Program to be announced soon
  (I.e., easy to do what I’ll describe today)

Example: Reactions to John Kerry’s Botched Joke

You know, education — if you make the most of it . . . you can do well. If you don’t, you get stuck in Iraq.

Data and Quantities of Interest

- Input Data:
  - All social media posts (or other documents)
  - Categories (e.g., posts about US candidates, extremely negative, negative, neutral, positive, extremely positive, no opinion, not a blog)
  - Example documents from each category
- Quantities of interest:
  - Computer science: individual document classification (spam filters, Google searches)
  - Social Science: category proportions (% of email which is spam; % negative comments about Obama; % of Egyptian posts supporting the regime; support for different solutions to the Euro 3 crisis)
- Estimation:
  - Classifications add up to proportions only if accurate
  - High classification accuracy ≠ unbiased category proportions
  - 70% classification accuracy is high — disaster for category proportions
  - New methodology: unbiased category proportions,
    (even when classification accuracy is low)
What Else Can We do With this?

- You choose:
  - Data: country, documents, language
  - Categories: based on sentiment, topics, people, events, etc.
  - (often pre-censorship)
- You provide: example documents for each category
- Results: Highly accurate category proportions over time
- Qualifications:
  - Opinion not sampled randomly, but no pop quizzes about unknown subjects
  - Measures the ongoing conversation: the classical notion of “activated public opinion”
- Potential academic applications: very widespread

Some New Data Types

- Unstructured text: emails (1 LOC every 10 minutes), speeches, government reports, blogs, social media updates, web pages, newspapers, scholarly literature
- Commercial activity: credit cards, sales data, and real estate transactions, product RFIDPs
- Geographic location: cell phones, Fastlane or EZPass transponders, garage cameras
- Health information: digital medical records, hospital admittances, google/MS health, and accelerometers and other devices being included in cell phones
- Biological sciences: effectively becoming social sciences as genomics, proteomics, metabolomics, and brain imaging produce huge numbers of person-level variables.
- Satellite imagery: increasing in scope, resolution, and availability.
- Electoral activity: ballot images, precinct-level results, individual-level registration, primary participation, and campaign contributions

Some More New Data Examples

- Social media: facebook, twitter, social bookmarking, blog comments, product reviews, virtual worlds, game behavior, crowd sourcing
- Web surfing artifacts: clicks, searches, and advertising clickthroughs. (Google collects 1 petabyte/2 minutes on human behavior!)
- Multiplayer web games and virtual worlds: Billions of highly controlled experiments on human behavior
- Government bureacracies: moving from paper to electronic data bases, increasing availability
- Governmental policies: requiring more data collection, such e.g., “No Child Left Behind Act”: allowing randomized policy experiments; Obama pushing data distribution
- Scholarly data: the replication movement in academia, led in part by political science, is massively increasing data sharing

Enormous Emerging Opportunities for Social Scientists

- For the first time: technologies, policies, data, and methods are making it feasible to attack some of the most vexing problems that afflict human society
- A massive change from studying problems to understanding and solving problems
- And then there’s you & me:
  - In legislatures, courts, academic departments, …., change comes from replacement not conversion
  - Will we wait to be replaced? or put in the effort to convert and learn how to use the new information?

For more information

http://GKing.Harvard.edu
Social Language Processing: A new way to analyze a big heap of messages

David Beaver

University of Texas, Austin, Department of Linguistics

Social Language Processing:
A new way to analyze a big heap of messages

<table>
<thead>
<tr>
<th>Project PIs</th>
<th>Affiliation</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Beaver</td>
<td>UT Austin, Linguistics</td>
</tr>
<tr>
<td>Jeff Hancock</td>
<td>Cornell University, Communications</td>
</tr>
<tr>
<td>James W. Pennebaker</td>
<td>UT Austin, Psychology</td>
</tr>
<tr>
<td>Art Graesser</td>
<td>University of Memphis, Psychology</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Co-authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joey Freese</td>
</tr>
<tr>
<td>Chris Brems</td>
</tr>
<tr>
<td>King Liu</td>
</tr>
<tr>
<td>Fred Hoyle</td>
</tr>
<tr>
<td>Nia Dowell</td>
</tr>
<tr>
<td>Rachel Kestner</td>
</tr>
<tr>
<td>Cindy Chung</td>
</tr>
</tbody>
</table>

Acknowledgements: This work was funded by a National Science Foundation (NSF Grant No. 0429647) through the National Science Foundation’s “Scientific and Social Dynamics in Communication Networks” program, and by the AR (W911NF-07-0202).

Specific tools

- Linguistic Inquiry Word Count — LIWC
- Coh-Metrix
- Latent semantic analysis and Topics models
- Machine Classifiers, e.g. Max. Ent.

Applying strategic language analysis

- **Method:** psychologically and linguistically motivated analysis of political speeches, military communications, and social media.
- **Research Question:** can semi-automated analyses provide information about the nature and stability of a nation?

First LIWC example: a nation's temperature through the language of 1000 US bloggers
LIWC, speeches

[Chart showing LIWC scores for different categories such as Confident, Narrative Process, Social Relations, Emotional, etc.]

LSA Overlap: Adjacent Sentences

[Graphs showing LSA overlap for Mubarak and Zedong with years 1860, 1920, 1990.]

Chinese Cohesion

在中华民族面前民族主义。
中华民族的历史。
中华民族的文化。
中华民族的精神。
中华民族的未来。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运。
中华民族的命运..

Coh-Metrix: Arab Spring speeches

[Graph showing Coh-Metrix metrics for Arab Spring speeches]

Historical Analysis: Key Events and Cohesion of Mubarak Speeches

[Historical timeline with key events marked and analysis of speech cohesion]
Conclusions

- **Social language Processing** techniques can be used in strategic analysis of:
  - individual speeches
  - large collections of social media data
- **Automated analysis reveals patterns mirroring independently identified historical events**
- Every organization or nation leaks massive amounts of text: Social Language Processing converts this information glut into psychologically, socially, and politically significant data.
- Your mission, should you choose to accept it...
  
  *Interpret that data!*
A final Example of SLP in action: Status in Iraqi military communications

- Sample of 60 letters drawn from the Iraqi Perspectives Project (IPP; Woods et al, 2006).
- Twenty letters were selected from the IPP database for each of three conditions:
  1. high status -> low status
  2. low status -> high status
  3. equal status

1st Person pronouns in Iraqi military transmissions

2nd Person pronouns in Iraqi military transmissions

Causal words in Iraqi military transmissions

Interpreting the word count data

- Clearly low-level word frequency varies with status.
- But what does it mean?
- And can we do anything useful with it?

Using Machine Classifiers to build a predictive model of status
Sample mistranslations

- **Timestamp:** 2011-10-20T14:12:54
- **Original:** الله أكبر الله أكبر الله أكبر الأكبر ولله الحمد لعند الرحمن فكان القلب النبي للنبي
- **Machine translation:** God is great, God is greater for the largest agency Elshah and Elshah and God is great and thank God for the freedom of free people of Libya and Libya's pride lives Libya is free
- **liwc pos/neg:** 10
- **Human translation:** God is Great! God is Great! God is Great! There is no god but God and God is Great and God is the Praised Freedom for the free Libyan people and glory to Libya, free Libya lives!
- **Note:** In the phrase "[there is] no god but [the] God," it is translated as "for the largest agency"

- **Timestamp:** 2011-10-20T14:12:54
- **Original:** شكرًا للمجهود يكمن في قراءة الأخطار على جانب الكلما في العالم شكرًا لمجاهدها شكرًا للناس شكرًا للإنسان شكرًا للناس شكرًا للإنسان شكرًا للناس شكرًا للمجاهد
- **Machine translation:** Thank you, thank you Mohammed Mahdi ZEW Nbus Thanks All Jaber Thlab Thlab Thank you Thank you Thank Benghazi Misrata Thank western mountain Alzanton Thank you Thank you Thank you to Libby corner
- **liwc pos/neg:** 10
- **Note:** Libya gets translated as "Libby corner."

- **Timestamp:** 2011-10-20T17:18:36
- **Original:** ليبيا حرة وعموميات أثيوبيا حرة فاحترام ليبيا حرة
- **Machine translation:** Libya's Muammar free I'm Matt Libby a free and proud Libya is free
- **liwc pos/neg:** 7
- **Human translation:** Libya is free! Muammar has died! I am a free Libyan and I take pride in free Libya!

- **Timestamp:** 2011-10-20T17:18:36
- **Original:** ومن كان يحب الله انك من ممقرر فإن موهبة خطاء ..... لابن الله حي وإنها حي وإنها حي...
- **Machine translation:** The likes of Muammar al-Muammar, the dead!!! It was like God, God is alive to senior underwriter .... God is great and thankfully lived Libya is free...
- **liwc pos/neg:** 6
- **Human translation:** Whoever used to love Muammar, verily Muammar has died! And whoever used to love God, verily God lives and does not die! God is Great and God is Praised and free Libya lives!

Selected References

Rumors, Truths, and Reality: A Study of Political Misinformation
Adam Berinsky
Department of Political Science, MIT

Google Trends Results, "Obama Birth Certificate"; 2008-2011

July 2010 Polimetrix Survey
○ Do you think that Senator John Kerry lied about his actions during the Vietnam war in order to receive medals from the U.S. Army?
  • Yes: 35%
  • No: 34%
  • Not Sure: 31%

July 2010 Polimetrix Survey
○ Do you believe that Barack Obama was born in the United States of America?
  • Yes: 55%
  • No: 27%
  • Not Sure: 19%

July 2010 Polimetrix Survey
○ Do you think the FBI and the CIA make sure that there is a steady supply of guns and drugs in the inner city?
  • Yes: 15%
  • No: 63%
  • Not Sure: 22%
July 2010 Polimetrix Survey

- Do you think that people in the federal government either assisted in the 9/11 attacks or took no action to stop the attacks because they wanted to United States to go to war in the Middle East?
  - Yes: 18%
  - No: 64%
  - Not Sure: 18%

July 2010 Polimetrix Survey

- Do you believe that a spacecraft from another planet crashed in Roswell, New Mexico in 1947?
  - Yes: 22%
  - No: 45%
  - Not Sure: 33%

Distribution of Beliefs

Partisan Divisions

How Can We Correct Rumors?

- Rumors are sticky
- Direct contradiction?
  - Intuitive: Fiction vs. fact
  - Reinforcing rumors: correction backfire
  - Schwarz’s theory of fluency
  - Counter-arguing?
- Source credibility
  - Motivated reasoning
  - Not all arguments are equally effective
  - The role of partisanship

...But Only on Partisan Questions
Rumor Only

Health Care Reform: Will There Be Death Panels?

By: Joanne P. Hall
Published November 15, 2009
WASHINGTON, D.C. — With health care reform in full swing, advocates and critics alike are concerned that the legislation will result in the return of "death panels" in the United States.

However, a closer examination of the bill shows that the legislation contains no provision for the return of "death panels." Instead, the bill focuses on improving access to health care and making the system more efficient.

The bill creates a "Medical Review Panel" that will review cases of patients who are terminally ill and determine if they are eligible for experimental treatments. If the patient is deemed ineligible, they will not be denied coverage for other treatments.

Rumor + Correction

Health Care Reform and Death Panels: Setting the Record Straight

By: Joanne P. Hall
Published November 15, 2009
WASHINGTON, D.C. — With health care reform in full swing, politicians and citizens are concerned that the legislation will result in the return of "death panels." However, a closer examination of the bill shows that there is no provision for returning "death panels."

The bill creates a "Medical Review Panel" that will review cases of patients who are terminally ill and determine if they are eligible for experimental treatments. If the patient is deemed ineligible, they will not be denied coverage for other treatments.

Rumor + Republican Correction

Health Care Reform and Death Panels: Setting the Record Straight

By: Joanne P. Hall
Published November 15, 2009
WASHINGTON, D.C. — With health care reform in full swing, politicians and citizens are concerned that the legislation will result in the return of "death panels." However, a closer examination of the bill shows that there is no provision for returning "death panels."

The bill creates a "Medical Review Panel" that will review cases of patients who are terminally ill and determine if they are eligible for experimental treatments. If the patient is deemed ineligible, they will not be denied coverage for other treatments.

Rumor + Democratic Correction

Health Care Reform and Death Panels: Setting the Record Straight

By: Joanne P. Hall
Published November 15, 2009
WASHINGTON, D.C. — With health care reform in full swing, politicians and citizens are concerned that the legislation will result in the return of "death panels." However, a closer examination of the bill shows that there is no provision for returning "death panels."

The bill creates a "Medical Review Panel" that will review cases of patients who are terminally ill and determine if they are eligible for experimental treatments. If the patient is deemed ineligible, they will not be denied coverage for other treatments.
### May 2010 Death Panel Results (Attentive Sample)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22</td>
<td>18</td>
<td>15</td>
<td>14</td>
<td>18</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>20</td>
<td>18</td>
<td>37</td>
<td>19</td>
</tr>
<tr>
<td>Not Sure</td>
<td>38</td>
<td>34</td>
<td>28</td>
<td>22</td>
<td>26</td>
</tr>
</tbody>
</table>

N=74; χ²(2)=15.54, P=0.05

### May 2010 Euthanasia Results (Attentive Sample)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>13</td>
<td>17</td>
<td>14</td>
<td>15</td>
<td>13</td>
</tr>
<tr>
<td>No</td>
<td>35</td>
<td>56</td>
<td>60</td>
<td>69</td>
<td>60</td>
</tr>
<tr>
<td>Not Sure</td>
<td>21</td>
<td>26</td>
<td>26</td>
<td>16</td>
<td>24</td>
</tr>
</tbody>
</table>

N=876; χ²(2)=23.95, P=0.002

### Euthanasia Results by PID (Attentive Sample)

#### Democrats

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>4</td>
<td>8</td>
<td>5</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>26</td>
<td>30</td>
<td>28</td>
<td>33</td>
<td>12</td>
</tr>
</tbody>
</table>

N=587; χ²(2)=4.42, P=0.11

#### Republicans

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>22</td>
<td>33</td>
<td>24</td>
<td>37</td>
<td>19</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>20</td>
<td>19</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Not Sure</td>
<td>28</td>
<td>40</td>
<td>33</td>
<td>22</td>
<td>32</td>
</tr>
</tbody>
</table>

N=533; χ²(2)=13.13, P=0.002

### May 2010 Support for Health Care Reform (Attentive Sample)

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>71</td>
<td>42</td>
<td>66</td>
<td>54</td>
<td>70</td>
</tr>
<tr>
<td>No</td>
<td>40</td>
<td>58</td>
<td>14</td>
<td>57</td>
<td>81</td>
</tr>
</tbody>
</table>

N=74; χ²(2)=0.093, P=0.66

### Euthanasia Panel Data

#### Wave 1

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>10</td>
<td>18</td>
<td>11</td>
<td>8</td>
<td>18</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>18</td>
<td>12</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10</td>
<td>18</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

N=66; χ²(2)=22.2, P=0.002

#### Wave 2

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Rumor Only</th>
<th>Rumor+ Correction</th>
<th>Rumor+ Republican Correction</th>
<th>Rumor+ Democratic Correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>12</td>
<td>18</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>No</td>
<td>10</td>
<td>18</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Not Sure</td>
<td>10</td>
<td>18</td>
<td>10</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

N=66; χ²(2)=11.1, P=0.00
III. People, Power & Pressures on Governance: Threats & Opportunities

Framing Questions

What evidence do we have that cyberspace enables people to put pressure on governments?

Does the cyber participation of people influence the distribution of power in international relations?

How have governments responded, if at all, to any cyber-enabled power of people?

Can we identify new opportunities or modes of behavior for people, the state and the international community?

What will be the effect on international relations now and in the future?

Panel

Moderator
Melissa Hathaway, Harvard Kennedy School

Panelists
Chappell Lawson, Political Science Department, MIT
Joel Brenner, Cooley LLP
Roger Hurwitz, Computer Science and Artificial Intelligence Laboratory, MIT

Presentations

Melissa Hathaway

Three main themes are central to the discussion of people, power, and pressures on governance: These are (a) people and governments, (b) privacy, and (c) government control over the Internet.

Even Machiavelli talked about political implication of technologies. Politics sometimes supports technologies and sometimes discriminates against it. There are citizen services,
voting on the Internet, democratic decision making, and we have to balance surveillance, privacy, and anonymity. Conversations always come down to the theme of regime stability – and the choice of shutting down versus listening to the nature of the informant.

What is the evidence that cyberspace is able to put pressures on governance?

**Joel Brenner**

(Author of the recently released “*America the Vulnerable: Inside the New Threat Matrix of Digital Espionage, Crime, and Warfare*”)

There is an increasing transparency in our lives, both positive and negative. Transparency is *the overarching* trend in this panel discussion.

The relationship between privacy and transparency is similar to what Shakespeare said about drink and lechery:

“It provokes the desire but it takes away the performance. Therefore much drink may be said to be an equivocator with lechery: it makes him and it mars him; it sets him on and it takes him off.”

There are remarkable examples in the last few years about how this effects governments. Government is all at once a dis-intermediary and the government is an intermediary. For example, CIA rendition flights were exposed by hobbyist plane spotters who made notes in paper and pencil of the tail numbers of aircraft coming and going from large city and small regional airports. This analog, individual tracking information was then correlated with other plane spotters around the world. Instantly, people could see whether a plane that was at Andrews Air Force Base and Guantanamo went to Poland, Romania, Egypt, etc.

The tail number of planes has always been available to the general public. Now, individuals are able to find all this information with just a laptop – along with the registrant of the aircraft and if the tail number marking has changed with the lifetime of the aircraft. You cannot change the tail number and get with it anymore. In the struggle in Iran or the Wikileaks controversy, transparency is the core matter in all cases.

**Roger Hurwitz**

With new vulnerabilities, how will the government protect us? How can various stakeholders work together (the government and/or utilities) for the protection of the individual? Is there a deficit of democracy? Is democracy exacerbated or ameliorated by the Internet?
The matter of publicity turns the conversation to the notion of information that is not necessarily hidden by a government, but information that a state actor is not necessarily anxious to make public. This inadvertence should be considered besides just the idea of transparency (voluntary or involuntary).

For example, Hungary, for the first time ever, published the budget of their country, which was a big change. People can see things like murders of citizens of Iran on their sidewalk, which has an effect on the Iranian regimes standing around the world. The difference between transparency and publicity is not just that we know that it happens, but that we care enough to say something about it that might affect our relationship to the government. No government can hide what it does to its citizens – whether it is a journalist through video, but publicity leads to a spirit of caring at the global level.

In the U.S., there is a tendency to see all good things coming together in the final stages. We assume that society as a whole is changing with the assumption that because we’re demonstrating through an Internet demonstration, that there exists a secular liberal society that was the source of that demonstration. In short, we need to recalibrate our assumptions.

**Chappell Lawson**

When it comes to the political implications of new digital technologies on large-scale events like regime change, etc. – there is an enormously rich potential for research and there are also significant theoretical gaps (i.e., what should we expect to happen as a result of diffusion of new media technologies?). There are two generic ways of conceptualizing the effect of communication on the individual: (a) through a change in attitude, and (b) through a propensity to act on your attitudes.

The latter concept is much less well researched. There is no evidence that communication transmitted through new technology is more persuasive (or has a higher level of efficacy) than traditional technology. However, the propensity to act on one’s attitude can be influenced by the low barriers to entry and access of the technology in becoming an active citizen. There are the added issues, however, of the source credibility of the information and the fact that the sheer amount of information and images can sometimes quickly contradict one another - impeding action.

So what is the fundamental difference of the Internet from other communications mediums in changing attitudes and getting people to act? Where do we expect to see this fundamental impact in the medium? Political scientists expect the impact of the Internet to apply equally, but this only happens in certain places where:

1. People have access to these new media technologies;
2. Where states were sufficiently weak and structured and cannot control the Internet;
3. Where state actors are resented by citizens; and
4. Where there are few civic organizations with capacity to mobilize citizens.

Thomas Paine's *Common Sense* is an example – there was an attitude-changing element of this book by the author (i.e., why monarchical rule is terrible – all aimed at changing American attitudes towards the mother country). Paine also talks about how we can attack British naval power. This portion of the book is not quoted as often - but this goes to this notion of the propensity to act on your attitudes (i.e., how it was possible to actually defeat the British).

But what of the format of the message? If one receives a piece of information by e-mail there is no reason that this format should be more persuasive than if the message was received via television. Particularly salient, the Internet is influential in affecting the propensity of people to act during a coup or conflict.

For example, people could see the Soviet coup in 1992 or Romanian revolution or hear Gorbachev's articulation of doctrine. By the very viral nature of the Internet, you do not have to wait for the television station to broadcast it. If regime change is about the willingness of security forces to attack demonstrators – then the question is how many people can gather in one place at one time, which is potentially where the Internet fundamentally excels (i.e., mobilization).

**Open Discussion**

**Government**

At this time, regime change in the United States, is the regime that is under threat, or the “establishment” – media narrative was 100% on establishment of deficit, after Occupy Wall Street, that narrative was totally gone and has been replaced with narrative about 99% and 1% – the establishment collapsed and no one noticed it? What is under attack? Regime or establishment? The Occupy movement triggered the collapse of establishment by changing narrative to 99% and 1%.

- The U.S. is not under threat but the administration is. The difference between the UK and the U.S. government – the government is not under any danger in the United States, what is under attack is both the government in the UK sense (administration) and the elites in the government – overstated the fact that cliques have collapsed – little early.
- The principle of consent of the governed and how it relates to the Internet. “Consent of the governed” – one of the things that the social networks do, does this degree of zero friction tend to increase or tend to decrease the new consent of the governed?
- There has been a gradual increase in constant plebiscites by creating feedback loops
that did not exist and by accelerating these feedback loops.

- We must consider the crucial role of atomized citizens and their behavior in the aggregate.

Data Matters

There are ambiguities on the relationship between data and prediction. To ask if social science is more like economics, begs the question why did economists not predict the economic crisis

- Depends on how we measure things – what we might see is constant use of plebiscite – the notion we have created feedback loops where none existed and accelerated the ones that do exist, this makes governing quite different as a practical matter.
- Constant plebiscite is in the making. This is the issue raised earlier. The level of tweets on a budget proposal, payroll tax cut extension, becomes taken into account, this is indeed a concerning thing about the consent – there are going to be swings “issue by issue” – as a result of providing social services, and that unions and political parties have done, thinks that there is a lot of “noise” – problem in politics is enabled by the new wave of communication technologies – long term political organizations.

Expectation of assumptions – because you are able to gather all this data, you can predict the future – we understand these equations and understand exactly what is going to happen – if economists are so smart, why aren’t they rich and why didn’t they stop this crisis? Why didn’t we understand the details underlying assumptions?

- We’re not doing our job when it comes to cyberpolitics, as we haven’t articulated clear arguments that we can directly verify
- But we recognize that the social sciences are making quite extraordinary progress towards predictive analysis. (Note the issue in Foreign Affairs on regime change, etc.)

Privacy

Discussions with students seem to indicate students do not care about privacy except for if it threatens their job even though it might constitute a long-term threat to freedom in America. What do people perceive with respect to that? Is that a problem?

- What is privacy? What type of information do we want others to know and who? Also, there is less embarrassment over the revelation of certain issues. It is not threatening but shows a change in the notion of privacy and is comparable to village
life but lacks constraints on village behavior. It is an issue of trust and behavioral constraint.

- It is not off base at all, that's an important phenomenon – issue of definition, personal secrecy, what do we not want others to know because that would give them something that they could know, how they could shame us?

**There may also be dimensions or features to the privacy issue:**

- People are less shamed than they used to be. There is now mass advertising relating to sexual dysfunction, or adult diapers – that people a generation ago wouldn't talk to their own doctor about.
- Let's not leave McLuhan out of this – he was a prophet – discussing aspects of village life – what we don't have are village constraints on behavior – people in DC or Boston drive differently than small towns – when you drive badly, or are rude or shout at people, you won't see that person again. In a small town, you'll see them before the day is out again. Those are constraints – we have certain aspects of village life and not others – trust and behavioral constraints

**And there are generational issues:**

- The same holds for in the MIT village. Separate question as to whether it's a village – MIT – if I'm wearing a bathing suit, but if everyone else is also, it's not a problem. It is only a problem if everyone else is wearing a suit, if pictures of that is distributed widely would be embarrassing – MIT students think everyone is wearing a bathing suit and older generations thinks everyone is in a suit.
- We don't fear the police for expressing ourselves politically.
IV. CyberPolitics and democracies: Where are we headed?

Framing Questions

What evidence is there that cyberpolitics is influencing traditional political behavior?

How are different governments reacting to increased cyber access by various constituencies?

What new or notable simulation or other tools have been developed to help us understand political participation in democratic societies?

Panel

Moderator
James Dougherty, Council on Foreign Relations

Panelists
Archon Fung, Harvard Kennedy School
Peter Brecke, Political Science Department, Georgia Institute of Technology
Ethan Zuckerman, Media Laboratory, MIT

Presentations

Archon Fung

Participatory democracy and technology calls for new hypotheses. The analogical thinking hypothesis is incorrect: some of the thinking in the field of politics and technologies tries to draw the analogy between the experience of technology & the technological domain. Since technology transformed other domains (music, film, e-commerce, the book, streaming video) the conclusion is that technology will also lead to similar changes in politics.

There is a plausible reason why this hypothesis is wrong: a fundamental difference in demand. The rise of killer technologies (e.g., Blockbuster and Netflix in the media domain) is not available in the political domain because it is characterized by collective action. There are four hypotheses to this discussion:

(1) Disintermediation Hypothesis: The primary effect on politics of ICT is that it makes large organizations less relevant because it reduces the organizational friction and coordination costs. ICT is also limited because there are still a number of collective action problems.
(2) **Public Sphere Hypothesis:** ICT allows more people to communicate and get ideas out, reducing the domination of the public sphere by capital and capital equipment. ICT allows for more voices to be heard, but it's inconclusive whether ICT hurts or helps democracy overall. This enables people to cluster into affinity groups, and improves function all around. An important caveat is this: ICT opens up public spheres that are controlled by authoritarian regimes. ICT improves the quality of democracy in places where governments are controlling.

(3) **Transparency Hypothesis:** What ICT fundamentally does is make information more available and more credible and legitimate. The transparent Kenyan budget-tracking tool is an example of fiscal transparency by the state.

(4) **Organizational Amplification Hypothesis:** What ICT does is amplify the functions of existing organizations gradually? This hypothesis is less radical than hypothesis (1) and (2) but more incremental. The hypothesis is based on the notion that people will buy technology to advance their platform and to communicate or propagate their message. There is great potential for growth in the field of political science to enable organizations to utilize ICT to achieve their goals.

Finally, there is the ever-present issue of information becoming knowledge and wisdom. Two individuals may both hate the current regime, but are unaware of each other's similar position. Social media may allow for the sharing of this knowledge - which misses the fact that there are resources necessary for collective action *in addition to information.*

**Peter Brecke**

The basic idea of Isaac Asimov's *Foundation Series* was to simulate the future. Another formative book: *Psychohistorical Crisis* by Donald Kingsbury was inspirational. Turning Asimov on its head – to figure out where we want to go through the conscious design of a society led to 'Democracy 2.0'. Democracy 1.0 is what we currently live in now in 21st century. Democracy 2.0 is fundamentally about empowerment and participation.

The first step has been to identify the core elements of democratic governance (the current set of institutions and rules). The next goal is to determine a metric for how well we are governed.

The Human Well Being (HWB) index is a framework that was formulated to be a measure of social well-being, security, freedom, prosperity, social mobility, civic participation, and good governance.

A methodology being developed for individuals to voice their dreams and articulate their ideas about how society should operate is a place to make a contribution to the preferred societal design. The ideas can be specific or general. It is a venue in which good,
generalizable ideas can ‘rise up’ and be exposed to larger audiences. This methodology is called the Preference Determination Process (PDP). It is a platform to discuss and debate alternative societal designs and the resources and activities needed to reach them. Ideally, this model builds upon existing participatory processes such as Locally-Managed Marine Areas in Fiji or Jirga in Afghanistan.

The PDP can be deployed at different technological levels: both face-to-face meetings such as design charrettes done by urban planners and computer-based venues for interaction (such as Facebook and Second Life) should be used to maximize participation. PDP should be voluntary and inclusive in terms of who can participate. Another important design element is the ability for people to choose whether they want to focus on local or global issues.

The Alternative Testing Model (ATM) is a tool to help those participating in the PDP to discern, to the best of our knowledge, the likely consequences of different choices regarding:

- Governance structures
- Rules for institutional behavior
- Policies to deal with different issues

Through formative thinking on the functionality of the ATM, people should be able to query the ATM (i.e., a computer simulation program) in order to model the likely consequences (to the best of our knowledge) of making a particular choice. Users must be able to query the ATM to any level of detail (theory, data, etc.) in order to better understand how it arrived at the conclusions. Users must also be able to try out their own alternatives (which others can challenge).

Some early, fundamental problems need to be overcome to make an ATM:

- Designing components of the ATM – The Integration of Social Processes
- Establishing a basis for accepting ATM results – Theory and Evidence
- Transforming theories into computable code of the ATM – The Representation of Theories
- Modeling the spread of ideas in a population – The Spread of Ideas
- Process for assembling the ATM – A Pathway to the ATM

They are all currently under construction.

Slides at the end of Session IV.

Ethan Zuckerman

There are activist populations that used digital media in 2011: the Arab Spring, the Occupy movement and Russia (which were literally playing out while the ECIR Workshop convened). The three reasons why digital media are important to activism:
(1) Social Media Mobilization Thesis (Clay Shirky): The basic premise is that it just takes a click of a mouse to mobilize people. This theory is false because it works independent of the advent of the mobile phone. People can get mobilized based on plain old telephone service (POTS), talking with people at church, etc. There is not necessarily a quantum shift from the Internet. However, the ability of a government to shut down a system in the moment of political turmoil (The Egyptian disruption of Internet service for example) is unprecedented. What is the cost of this? To conclude, thesis 1 is an important thesis, but not revolutionary.

(2) Attention Thesis (The Tunisia Model): For this thesis, there are parameters based on the way the events in Tunisia played out. To start, the Tunisian village was cut off from the rest of the world Facebook heavily monitoring by Tunisian government countrywide. However, information on Facebook was picked up by the Tunisian diaspora, aggregated by these “bridge bloggers”, then attracted interest from mainstream media broadcast outlet Al-Jazeera. Broadcasting of the information by Al-Jazeera did not trigger Tunisian government concern because Al-Jazeera was not present on the ground. In summary, the parameters of the Tunisia model are:

- Facebook is thoroughly monitored by state actors.
- Media gets posted, gets translated and made available to media organizations by “bridge bloggers” usually members of a diaspora community) – who then broadcast it (Twitter, Facebook, YouTube, etc.).
- Al-Jazeera than agrees to broadcast it.

Today, because of the Tunisian uprising, there are more efforts to control the Internet more robustly by other state actors. How is the digital realm changing government? For the activist community, censorship is the sincerest form of flattery. This behavior is a very interesting, revolutionary development. Social media therefore is a way of influencing current social practices. The growing challenge is circumventing censorship. The role of social media and its use by activists in relation to government control is illustrative. Activists in Egypt are aware that the government is monitoring the social media sites, so social media is not necessarily used for political discussion. Instead, it is used as one of the tools in political activity or used with the knowledge it is being monitored and therefore, the communications are adaptive.

It is interesting that Iran did not shut down the Internet during the Green Revolution (even though much more centralized than in Egypt). Instead, Iranian government slowed Internet access down significantly – but kept email communication active to continue its use for commercial activity.

(3) Need of New Media Thesis: In Russia there is a desperate attempt to create new type of media because traditional media is heavily controlled by the government. A nationalist and a democratic fringe is heavily involved in this attempt to create a new type of media. At the
same time, two significant Distributed Denial of Service (DDoS) attacks by two criminal botnets shut down state-controlled media websites. These botnets were used to take down media groups that were trying to pull data on election violations. To be clear: criminal botnets have been used to shut down coordination and aggregation of information on the problems with the election. This suggests that these models are not purely effective for the activists (as tool usage is omnidirectional by all types of state and non-state actors). But, with this jamming of media sites, we can see what mechanisms are important for enabling dissidents to voice their political message online.

In some final observations (which are a part of the upcoming book *Access Contested*):

- Russia has not yet bothered to filter the Internet but instead makes it difficult to speak. As a result, they shut down certain people’s services and/or websites. There is a display of control aspects being employed during the recent December 2011 contested election. It will be interesting to see how this develops.
- Tunisia: The government is blocking Google sites, YouTube, Twitter, Facebook, etc. Facebook was considered a great rallying point, so blockage of service by the state actors was a huge loss. The activist’s solution was e-mailing people and encouraging them to use a joint Facebook proxy site. The number of people on Facebook had seemingly declined because the people were using this secret backdoor access point.
- It is difficult to determine what a dictatorial government intercepts from the individual when people log into Facebook. Many different encryption tools being used by the administration to pocket people’s password.

**Open Discussion**

**Filtering**

What is the ultimate effect on the legitimacy of the regime? Compare the effectiveness of the multi-layers of Russia, Iran, and China? Which is most/least effective?

- Iran is effective in filtering the Internet: There is a fairly robust blogging community. China knows it can’t fight social media so what it does instead and Chinese social media created instead. China may be the most effective. In Russia, however, there is a legitimate nationalist group and a liberal group. Russian drum protest to fight election results. Impressive technical skills of oppression demonstrated in Russian.
- Distributed Denial of Service (DDoS)-There are two ways to proceed:
1. Hire outside criminal group like a botnet and batter a site down.
2. Mobilize a movement to launch this attack. A suggestion “hide behind big rocks” like Amazon.
   - New hybrid strategies are developing: The media and Internet and how they are linked together. You determine truth by its acceptance in the market place of ideas.
   - The ultimate effect on the legitimacy of the regime. Early reports from Russia suggest they have paid a high price in legitimacy. Compare effectiveness of Iran, China, and Russia. China has a multi-level scheme.

In terms of longer-term legitimacy, which of these models is likely to be most/least effective? What is the effect on legitimacy of regime, for example, Russia paying a high price in terms of legitimacy for the devices used; China on the other hand has a multilayered scheme controlling for example ISPs but also local level down to the community level; Which model is likely to be most/least effective? Iranian, Russian, China?

   - In these models, the first was about Iran, the second China, and the third Russia. Iran has been effective. China had the incredible innovation because China knows it cannot control social media so instead Chinese government built Chinese social media, which is surprisingly active and open and includes political activity. An enormous amount of imagery comes across, and a lot of it is about politically sensitive topics (e.g., censorship). Putin is going to suffer some real harm, not just from the extent which he will be forced to mobilize, but also from the steps he’s already taken. Increasingly from the Nationalist side of Russia we are seeing desperate techniques – DDoS, or Twitter bots, when they can’t get real people. In the long run, the technical skills of Russian oppression are impressive. They have raised the game. China will win in the end.

**Distributed Denial of Service Attacks (DDoS)**

What are some details on reports regarding Russian DDoS attacks in comparison to the 2007 DDoS attacks in Estonia? When there is a DDoS attack, what needs to be done to repair it or get back to normal? What about botnets? Were these unrelated to the DDoS?

   - In 2007, Russian nationalist launching DDoS attacks whereas in 2011, DDoS attacks carried out by two criminal botnets, which have taken down some real heavy weights. What was interesting about Russia vs. Estonia is that it was a voluntary botnet. Arbor networks spend a lot of time tracking these botnets, their Command and Control structure, and where they’re coming together for an attack. What do we do about it? Surprisingly hard. The short answer is that it is hard for most small organizations to survive a good DDoS.
DDoS attacks have become a national security threat and it is mostly funded by credit card fraud, and if the U.S. would just get its act together and implement good credit card security. But there are measures that could have already been taken a long time ago.

- Netherlands model is another option where ISPs are very aggressively shutting down infected computers and putting them into walled gardens informing users that their computer has been compromised and needs to get fixed because ISPs have come together.
- There is still a lack of understanding of linkages between various types of media.

**Movement of Information**

**Thinking of the total ecosystem, there is research that shows that information moves back and forth from Facebook to TV or back. How do they multiply each other?**

- This is a place where we are hoping to get a lot of help from the Political Science community. Right now there are neat papers on how Twitter works. We do that because we can get good data. But if the real stuff happens at the interface between Twitter, newspapers, blogs, and radio shows, that’s hard. We realized analyzing political blogs that we needed transcripts every time Rush Limbaugh goes on the air.
- It is really important. Almost all the examples you can think of are hybrids. WikiLeaks for example. We need a lot of work to understand it. That’s one dimension. A second dimension is what exactly the content is. Oliver Wendell Holmes quote, idea of the truth getting accepted in the marketplace of ideas, whereas now people are arguing for “let the best meme win”, a much different idea.
Democracy 2.0: An Example of a CyberPolitical Governance Form

Peter Brecke
Sam Nunn School of International Affairs, Georgia Institute of Technology

Background and Motivation

- Asimov's Foundation Series
  - Hari Seldon, Prima Facie, Seldon Plan
  - The Seldon Foundation used the computational model to lead to a better society
- My work since then has been to give us this type of capability
- Fulfil Asimov's vision on its head
  - Kasaba's Predictability Crisis
- We should through a democratic process design and implement the societies we would like to live in

Goal of Society Design Process

- To come up with desired societal designs
- Societal designs are descriptions of societies in terms of what we think are the important characteristics of societies
  - Part of that description is how well-off the population is with respect to fundamental aspects of human conditions: security, freedom, prosperity, social mobility
  - Another part pertains to the structure and operations of the mechanisms of governance
- Democracy 2.0 is a societal design that possesses a built-in society design process

Democracy 1.0: The Current Set of Institutions and Rules

- Individuals Define Moral Compass
- Communication Media
- Existing Institutions of Governance
- Governing Choices and Actions

These are the core elements of a democratic governance system

Democracy 1.1: A Measure of How Well We are Governing

- Individuals Define Moral Compass
- Communication Media
- Existing Institutions of Governance
- Governing Choices and Actions
- Human Well-Being Index

Human Well-Being Index: describes position and trajectory in a variety of social indicators
Human Well-Being Index

- A measure of six important dimensions of life in a society germane to governance
  - 4 dimensions pertaining to the circumstances of the members of a society, social well-being
  - 2 dimensions pertaining to the governance system's ability to achieve or maintain desired values of social well-being
- The measure includes distributional considerations
- There is an expanding empirical measure
Preference Determination Process (PDP)

- A vehicle for individuals and groups to voice their dreams and articulate their ideas about how society should operate.
- A place to make a contribution to the preferred societal design.
- Ideas can be specific or general.
- A venue in which good, generalizable ideas can "rise up" and be exposed to larger audiences.
- A place to discuss and debate alternative societal designs and activities needed to reach them.
- Ideally builds upon existing participatory processes such as Locally-Managed Marine Areas in Fiji or Jirgin in Afghanistan.

Different Technological Levels for the PDP

- Both face-to-face meetings such as Charettes done by urban planners and computer-based venues for interaction such as Facebook and Second Life should be used to maximize participation.
- Voluntary and inclusive in terms of who can participate.
- People should be able to choose whether they want to focus on local or global issues.

Democracy 2.0: Empowerment of Participation

Alternatives Testing Model (ATM)

- A tool to help those participating in the Preference Determination Process.
- A tool to help people discern, to the best of our knowledge, the likely consequences of different choices regarding:
  - Governance structures.
  - Rules for institutional behavior.
  - Policies to deal with different issues.
Use of the ATM

- People should be able to query the ATM, a computer simulation program, what are the likely consequences (to the best of our knowledge) of making a particular choice.
- Users must be able to query the ATM to any level of detail (theory, data, etc.) how it arrived at the conclusions it did.
- Users must be able to try out their own alternatives (that others can challenge).

Elements of Creating an ATM

- Below are fundamental problems that need to be overcome to make an ATM.
  - Design and components of the ATM
    - "Integration of Social Processes"
  - Establishing a basis for accepting ATM results
    - "Theory and Evidence"
  - Transforming theories into computable code of the ATM
    - "The Representation of Theorists"
  - Modeling the spread of ideas in a population
    - "The Spread of Ideas"
  - Process for assembling the ATM
    - "Endgame to the ATM"
V. Social Media & Social Action Learning from Experience

Framing Questions

What do we know about the types of social media shaping political protest in different contexts or countries?

- Does the use of social media shape new ideas or transmit prevailing ones?
- What functions do uses of social media provide? For example, create new constituencies? Aggregate potential ones? Shape multiplier effects? Other?

What about the behavior impacts of social media uses by governments, civil, society, other?

Is there any of escalating vs. de-escalating effects of social media on social behavior in conflict situations?

Is there a convergence or divergence worldwide in learning from experience?

Panel

Moderator
Venkatesh "Venky" Narayanamurti, Harvard Kennedy School

Presentations
Fergus Hanson, Lowy Institute, Sydney, Australia
Evann Smith, Department of Government, Harvard University
Robert Laubacher, Sloan School of Management, MIT

Introduction

Venkatesh "Venky" Narayanamurti

Due to the interaction between technology and the social context of their implementation, innovations often are hybrids and do not manifest themselves at extreme ends. The future is not just about technology - but socio-technology.
Presentations

Fergus Hanson

A video clip from a recent meeting of the Council on Foreign Relations was shown, where ex-Google CEO Eric Schmidt shared that he is:

“Extraordinarily excited about the scale of the mobile revolution” and his thoughts on the potential of the opportunity which lies ahead – which lies primarily in the developing world (1 billion global citizens going online via mobile devices which are as powerful as supercomputers were a few years ago) with a cost reduction which will make it all possible. People will not only be able to talk to each other, but “they can develop apps, organize in new and innovative ways and change the world.”

Someone in Eric Schmidt’s position may be excited about the potential market that lies ahead. As William Hague stated: “achieving agreement about the future of cyberspace will take time. But this is one of the great challenges of our time and we need to pursue it with the same intensity as efforts to eradicate global poverty or tackle climate change.”

Authoritarian regimes have realized the power and danger of social media. As a result, censorship is being stepped up. In the face of “Internet Freedom” agenda (as laid out by the State Department under Secretary Clinton), a commitment has also been made to a more subversive diplomacy – using web tools to undermine governments and international organizations. Cases of eDiplomacy illustrate this new trend.

Subversive technologies initially focused on China but broadened as result of the Arab Spring. An example is an “Internet in a Box” or “Media in a Suitcase” developed by the New America Foundation. The device allows for the development of what is the equivalent of a panic button for activists – allows activists to communicate even when governments shut down the Internet, send out messages to their contacts when they have been arrested or to delete all contacts immediately in case of arrest.

InterNews is another case study. InterNews gives activists tools to circumvent government control and conceal identity when visiting certain popular sites on the Internet. Advertised in 12 countries (Bahrain, Burma, China, Egypt, Iran, Ethiopia, Syria, Tunisia, Vietnam, Yemen, Turkmenistan, Uzbekistan) InterNews was downloaded half a million times.

NERD (Near-Eastern Regional Democracy) is another suite of tools, consisting of 3 programs: tool development, secure communications, and digital safety training for analysts. It is difficult to measure how effective this tool is. These tools are used by activists to mount protests for both laudable and questionable means.
The U.S. government has a set of websites in foreign languages presenting U.S. foreign policy to audiences abroad in an effort to counter extremism. The Digital Outreach Team Unit, set up in 2006, espouses positive images of U.S. and combats extremism in three different languages to challenge counter-conspiracy theories with facts. The success of the program caused Al-Qaeda to mount their own digital outreach team to counter U.S. State Department efforts in this counter-information effort. Overall, these sites have not all produced positive outcomes. Digital outreach of this nature sometimes provides soft messages about the U.S. The USAID funded Internet Freedom Campaign – providing technical assistance and developing a network of technical experts in the security domain to assist activists in the field.

The challenge ahead is that while we can generally agree with current causes taken up by those activists we are arming with these subversive cyber tools, what happens when we do not agree with what they do?

_Hanson's presentation is available upon request._

**Evann Smith**

The determining role of social media must be challenged. In 2004-2005, youth activists emerged and moved outside the constituted spaces of unified structure. The issues of risk (i.e., personal risk), relationships and the role of the Internet became salient.

High-risk mobilization requires strong ties and demands trust. The Internet builds weak ties and transmits homogeneous information. The Internet lowers the cost of communication, the ability to penetrate networks and increases the number of weak ties available to activists. In this context, social media accelerates the spread of information and its penetration of strong tie networks.

The relationship between social media and the mainstream media played an important role. Starting in 2005, social media expanded the reach of a limited social media network. The mainstream media enhances the credibility of social media content. Activists called upon Al-Jazeera for help broadcasting the message to promote protesting efforts to the world. This example is a clear case of how a mainstream media outlet amplified and expanded the reach of a cyber-network. Mainstream media _enhanced the credibility of social media content because television broadcast acted as quality control._ Al-Jazeera enhanced the credibility of these messages by broadcasting them to a larger, perhaps even global audience.

While not a mainstream media outlet, in an interesting twist, iPhones were just banned in Syria. There is also a large Islamist presence online. Social media did not cause the Egyptian uprising, but it did impact the complex networks through which it occurred. Uprisings are a self-organizing system.
Future research is needed on the sequence of events. The Arab experience is often viewed as a “Twitter/Facebook” revolution, but this view is fundamentally wrong because,

1. The revolution has not officially occurred yet; and
2. It denies the roots, the processes, and the history that brought people to the point of political action prior to the advent of social media tools.

To Egyptians on the ground, the revolt was the beginning. In 2005, it began to shift, with activists moving outside the institutionalized norms for communication. Before 2005, there were only 30 blogs. Blogs then experienced exponential growth - but this growth did not necessarily translate into action. A factory strike case that was organized via Facebook, failed.

From May 4, 2008 through July 23, 2009, political action in the Arab world was organized via social media but failed - and the pattern of failure repeated. What happened? Social media indirectly impacted this failure by reinforcing the network structure. It was not until 2010 that individual action took place.

Robert Laubacher

The Climate CoLab is a research project at the MIT Center for Collective Intelligence. Collective Intelligence leverages the wisdom of the crowds. Over the past decade or so, a new approach has emerged to tackle large, complex problems. Examples include Linux, Wikipedia, and Google. When one conceives of Google as a whole – including the millions who create links on the World Wide Web, the Google company crawlers that collect information about those links on an ongoing basis, and its clever algorithms that parse all this data and serve up bits of it to users when they type a search query – the entire system is a remarkable example of collective intelligence.

Global climate change is a problem of daunting scope and complexity. The Climate CoLab seeks to harness the collective intelligence of large numbers of people to address climate change and promote sustainable development. The Climate CoLab does this by:

- Breaking down the large overall problem into parts.
- Structuring crowd activity with contests (similar to other scientific and innovation contests i.e., the X Prize). Invite broad community to submit proposals. Expert review and community voting enable the wisdom of the crowd to judge the highest quality material. The top rated proposals are then presented to the UN and Congress.
- Using simulation models to discipline the entire process.

CoLab community growth to date includes:
CoLab work to date includes:

- **2009-2010**
  - Software development and community recruitment.
  - Proof of concept contests.

- **2011**
  - Contest on green economy, one of two major themes at the UN’s 2012 Rio+20 conference.
  - Continued community development, with particular emphasis on social media.
  - Building stronger linkages to policy makers and NGOs.

2012 Plans for the CoLab include applying hyper-specialization by breaking down macro problems into groups of key issues (e.g., reduce emissions through industrial reuse of materials, adaptation for agriculture, etc.). The community will then propose potential actions in each domain. Finally, the community will develop comprehensive proposals by selecting one option from each domain and noting the interdependencies between domains.

The overall goal is to connect with the world of policymakers. So far, there has been a dual response: some policymakers are enthusiastic about the prospect of the wider participation the CoLab can facilitate, while others express skepticism about the involvement of non-expert, unaccredited participants.

*Slides at the end of Session V.*
Open Discussion

Theoretical Implications

Evann Smith’s research on Egypt includes important theoretical implications showing that events such as the Arab Spring do not occur out of thin air

- Research based on theory of complex systems and adaptive systems grounded in analysis of empirical data.

Weak and Strong Links Between People

- The Facebook announcement of “I’m going to the protest” was not enough to push people to go out and risk personal safety. The political context is still being shaped.

How true is the claim that the Internet creates only weak links? So, what is the empirical grounding for assuming weak links? Could it be small groups of strong-tied groups? There is evidence otherwise: what is the empirical basis for the weak tie finding?

- Finding indicates that it is more likely that an activist will show up with his/her brother rather than someone he is friends with on Facebook.

State Advocacy vs. Political Subversion

At what level does state advocacy of human rights rise to the level of political subversion of another state?

- The answer depends on who you speak with and is different for different countries. After WikiLeaks, we had to calibrate Hillary Clinton’s “Internet Freedom” vision.
Social Media and the Egyptian Uprising

Evann Smith
Harvard University
December 8, 2011

Social Media and the Egyptian Uprising

Risk, Relationships, and the Internet

High risk mobilization
- requires strong ties

The Internet
- builds weak ties
- which transmit information

Social media accelerates the spread of information and its penetration of strong tie networks.

Tweeting Outward

- ishta dreams @3arabawy first video up, http://www.youtube.com/watch?v=-U3iE0QFywe. Crowds avoiding tear gas and police in Tahrir. #jan25 #egypt
- AyHGeleiba BREAKING: @Twitter is blocked in Egypt as protests ensue. Ustream has a live feed of the streets in Cairo. http://bit.ly/NUKy #Egypt
- bleekork FJ @weddady: URGENT: REQUEST to ALL EUROPE & US tweeps on #Jan25 PLEASE ASK YOUR MEDIA TO COVER #EGYPT NOW
- FourFriendsWay @Jan25 Friend near Tahrir (Square) says there are 35,000 people there. #Egypt #Jan25

Social media helped increase the domestic audience costs of public action for the U.S. administration.

Conclusion

Social media did not cause the Egyptian uprising.

But it did impact the complex networks through which it occurred.
Harnessing Collective Intelligence to Address Climate Change

Robert Laubacher

Research collaborators: Thomas W. Malone, Joshua Introne, John Sterman, Hal Abelson, and Gary Olson
## Selection of top contributions

<table>
<thead>
<tr>
<th>2010 contest results</th>
<th>2011 contest results</th>
</tr>
</thead>
<tbody>
<tr>
<td>* 1 category (global)</td>
<td>* 2 categories (global and national)</td>
</tr>
<tr>
<td>* 29 proposals total</td>
<td>* 64 proposals total</td>
</tr>
<tr>
<td>* 3 honorable mention</td>
<td>* 12 semi-finalists</td>
</tr>
<tr>
<td>* 4 finalists</td>
<td>* 8 finalists</td>
</tr>
<tr>
<td>* 403 votes</td>
<td>* 1750+ votes</td>
</tr>
<tr>
<td>* 3 winners</td>
<td>* 5 Winners</td>
</tr>
<tr>
<td>* UN-Congress briefings</td>
<td>* UN-Congress briefings</td>
</tr>
</tbody>
</table>

## Work to date

- **2009-2010**
  - Software development and community recruitment
  - Proof of concept contests
- **2011**
  - Contest on green economy, one of two major themes at UN’s 2012 Rio+20 conference
  - Community development with social media
    - Twitter remarkably effective for spreading the word
  - Linkages to policy makers and NGOs

## Community growth to date

- More than 35,000 unique visitors from 160+ countries
  - 40 countries with 100+ visits including U.S., Canada, EU members, Australia, NZ, and Japan plus Argentina, Bolivia, Brazil, China, Columbia, Hong Kong, India, Indonesia, Mexico, Philippines, Russia, Singapore, S. Korea, Thailand, Ukraine
- More than 3600 registered members (10% percent of visitors become members)

## 2012 plans

- Applying hyperspecialization to the CoLab
  - Break macro problem into group of key issues (e.g., reduce emissions through industrial reuse of materials, adaptation for agriculture)
  - Community proposes potential actions in each domain
  - Community develops comprehensive proposals by selecting one option from each domain
  - Experts vet resulting comprehensive proposals and community/experts select best ones

## References

- [Climate CoLab](http://climatecolab.org)
- [Climate CoLab video](http://techtv/videos/4171-the-climate-collaboratorium)
- [Collective Brainpower, MIT Spectrum, Summer 2010](http://spectrum.mit.edu/articles/normal/collective-brainpower/)
- [MIT Center for Collective Intelligence](http://cci.mit.edu/)
VI. Three Visions: Highlighting the “Next Generation” of Challenges for People, Power, and CyberPolitics

Framing Questions

What is the vision for the future of the Internet – or alternative futures thereof?
  o  How “fixed” are the features of the present Internet?
  o  How do Internet architectures influence cyberpolitics in international relations?

What are possible developments in “people power” given the growth of social media?
  o  Do recent “revolutions” and “protests” in various parts of the world reflect unexpected idiosyncrasy or systemic trends?
  o  How do we expect governments to react? Do we anticipate any movement toward “Global People Power”?

What are the research priorities relevant to “people, power, and cyberpolitics”?
  o  Are there particular “unknowns” that require more immediate attention than others?
  o  What is a “positive future?”

Panel

Moderator
  Stuart Madnick, Sloan School of Management, MIT

Presentations
  Herb Lin, U.S. National Research Council of the National Academies
  David Clark, Computer Science and Artificial Intelligence Laboratory, MIT
  Jonathan Zittrain, Harvard Law School
Presentations

Herb Lin

Views expressed are those of Herb Lin, and no one else.

There are a couple of fallacies in the study of cyberspace – namely, that, in principle, a bordered Internet is impossible and that the environment is not reactive. There is no reason “cyber borders” cannot exist – and we hear increasing calls for tailoring the Internet to serve various segments of society, i.e., copyright/entertainment industry, critical infrastructure, etc. The dominance of ‘offensive postures’ in cyberspace is largely true. According to computer science, good defense is impossible—that is, offense always beats defense—and so deterrence needs to happen. Then the political scientists and the policy people say that deterrence is impossible without good attribution—so we need to rely on better defense. And if you find this circular state of affairs intellectually unsatisfying, you’re not alone.

Then some analysts say that offensive operations are needed to eliminate cyber threats, so we acquire offensive capabilities in cyberspace. But any adversary would simply compromise a third party’s computers to launch an attack against us, or hold some of his own computers in reserve in an unattackable location. So why should we believe that our offensive cyber capabilities can eliminate cyberthreats against us?

As for the nonreactivity of the cyber environment, it is true that in the past, governments have been asleep at the switch and have been largely unaware of the power of the Internet. But recent events suggest that governments are no longer asleep, and they are at least aware of the Internet’s power, even if they may not know how to handle it yet. Moreover, despite the systemic difference between autocratic and democratic governments, both types of government have shown signs of moving in the direction of being more suppressive. Nation-states are reasserting themselves. There is concern with the use of social networks to control people and the monitoring of chats, Facebook and Twitter by government agencies, and many governments are moving to assert more and more control over various parts of cyberspace.

Regarding the rise of “people-power,” yes, we are seeing it happen. However, governments have many tools to intervene and use social media tools. It is not clear where the balance of power falls. Perhaps people will have transient advantages—but governments will eventually catch up and take action.

David Clark

The discussion is not one of the future of the Internet, but possible future(s) of the Internet(s). The more important question: who is driving the future of the Internet? This question is something you may not think about if your prerogative is profit or power and
control. Is there a 3rd way out? In a National Defense University publication chapter of “CyberPower and National Security” – the core argument is that technologists do not necessarily determine the future of the Internet.

Social scientists ask questions that are not driven by performance but questions of power and control. Engineers are not trained to think about such things. Social scientists, however, can sometimes be wrong because they do not understand the Internet. You do want to evaluate futures in terms of controls and powers. The question then becomes how best to compare these possible futures.

Living at the packet layer, it is astonishing what is happening at the information level and the difference between the rates of change at the application level compared to the protocol level (for example – the switch to Internet Protocol Version 6 [IPV6]). The packet layer is not interesting anymore. While the application and information layers are far more interesting.

The domain name system (DNS) is going to be a contentious area regarding control because of the ability to control the user’s experience. You do not need to use a DNS – you can just type the internet protocol address. When DNS was designed, during that design process we thought about resilience, not in terms of whether or not it could be controlled. Piracy is another area of interest. The United States removes a lot of content from the Internet with regard to content piracy.

The role of money is important in the development of information infrastructure. The best way to predict the future of the Internet is to invest in it. Who paid for what we currently have? The original Internet was created by researchers who were paid by the government with the outcome of an open platform. Today, companies such as Facebook and Google drive the shape of the Internet. In short, buy the future you want.

Another important trend is the increase in personalization and creation of massive data. For example, there is the question of attribution on a platform like Google+. Is it possible to create profiles with fake names for activists who would like to conceal their identities?

As a society, we should be asking: who should be driving the future of the Internet? In the U.S., it is currently the private players. In response to a question regarding if there will be more activity by private actors in the area of lobbying future telecommunications and Internet policy, the private sector moves faster than the government – but the government has various ways to affect how private actors spend their money, e.g., at the lower level of the Internet such as Comcast. The likely future is one we will not like very much.

Those who are funding the future are also heavily involved in the design process. As a result, we should be asking, “who should be shaping future Internet design?” A future Internet design concept of note is Information-Centric Networking (ICN). Why not connect
people to information (as compared to a node). There are a lot of interesting ICN proposals technically – but do not think about who they just empowered, in this case router operators, or the role of money. Architectures can be designed which unleash more independence, but no money can (or should?) be made from these architectures.

Jonathan Zittrain

The baseline design of the Internet was one of decentralization both from a technical point of view and from a political point of view (e.g., not directly linking IP addresses to national jurisdictions, an idea that has been floated with regard to IPv6).

That baseline is rapidly changing, with the rise of centralized applications such as Twitter for particular distinct services or Amazon offering website hosting services. Start-ups are more inclined to host their service at Amazon (a company with the strength to protect them). Threats like DDoS require a move to centralization through the use of Amazon cloud servers for survivability. There is the possibility of a return to three major networks (or three major providers).

This change has implications for power. DDoS, offensive state actions and sophisticated hacks are on the rise. IP layer filtering and application level filtering are also on the rise. The solution is a counterintuitive one, in that rather than pushing for engineers to accept importance of economics and the role of power, we should take a politically charged matter and make it an engineering matter (or technical problem).

For example:

**Public safety:** A technology like mesh networking can be a lifesaver in a situation where the Internet is shut down because of a natural disaster or kill switch. Mesh networking allows everyone to use his or her portable devices regardless of a physical layer shutdown. If a company like Facebook adopts a standard mesh networking service for disaster prevention reasons, it would change the balance of power between them and governments who might want to implement a kill switch.

**Mutual Aid Model:** Mutual aid at the level of the individual or a company can be driven by altruistic motives or self-interest. We can harness the interests of users and companies to create interdependent webs that increase the reliability of networks. However, even this raises questions: would such a model draw in people that have the bandwidth, the processing cycles, and human power to keep the Internet decentralized? What would small business mutual aid architecture look like? How can the unit of virtual aid be applied to act as an incentive for individuals or organizations to contribute to a mutual aid effort?

These are not insoluble problems, but they have important human rights and public safety implications. Individuals and organizations who need to protect themselves and to avoid
state control mechanisms can use mesh networks, which may be initially developed as technical solutions. This approach requires the conversion of an engineering problem into an ethical argument.

Ethical tensions like these date back to the debate surrounding free software and open source software. The open source movement converted ethical arguments into practical arguments, claiming that open source software had practical advantages. Advocates, like Richard Stallman from the free software movement, are more couched in ethical and human rights arguments.

**Open Discussion**

**Government and Social Media**

*Can government use social media to control people better?*

- It is a worry. An oppressive government can do bad things easily. The possibility of provocateurs on the Internet to cause uprising, use to gather data on activists and map their networks.

**Private Sector**

*What is the private sector's role in politics? Will control over technology in the private sector's hands lead to more influence in the future similar to lobbying now?*

- It is a cat/mouse, move/countermove; governments are quite capable of finding tools to shape how companies spend money. For example, lower level facilities owners, governments tell them what to do/ hands-off on info layer due to the 1st Amendment until WikiLeaks happens.
- China has no hesitation messing with info layer. This is why you see different Internet in different countries. Consider lobbying; is that not money?
- We live in a period of great excitement, where industry moves faster than government. The government is quite capable of finding tools to shape their investment. This is happening at the physical layer in the U.S., but China has no hesitation to play at the Application layer.
Mutual Aid

How does mutual aid play out with following the money?

- How much aggregating many of real tiny things can make a difference at the aggregate level? So, in a mutual aid framework, it is a question of what granularity, how big the group of companies willing to play and pay.
- People (at end nodes) have too much computing power – this is basically people power. How much can people be enticed to cooperate? What will draw in people?

How many people do you need to make an impact at the aggregate levels?

- Commercial example of mutual aid is Content Delivery Networks (CDNs). How much do you need? How can we nucleate and coordinate this type of large-scale activity without a central entity? Can authority be decentralized?
- How would the mutual aid architecture get coordinated, if this has to be decentralized?

Jurisdiction

In a world without borders, can you choose which jurisdiction you want to be in?

- It's like in SnowCrash – pick your own. But if it's a major decision, big bundle, large switching costs, but then platforms present ongoing investment.
- Some people choose to use alternative courts – private using public law but faster, etc. – dispute resolution.

By picking Amazon, you are picking private law.

- If there is much bundled and there is a great switching cost, the benefits are lost.

3D Printers

The Internet is not only about dissemination of information if we think of 3D printers moving not only information, but atoms.

- It is an ethical/ jurisprudential question – can we even think about trying to regulate that? Does going physical change your mind?
- It’s not guns you should be scared of. It is iGEM\textsuperscript{12} (International Genetically Engineered Machine – a synthetic biology competition for undergraduate students). Genetic code on the Internet, build your own.
With 3D printers, the CNCs we are talking about moving not just bits, but also moving items. How does this tie into this notion of power?

- There is an ethical question. Would it be ok to regulate such a thing?
- Bits can hurt.
- It will get down to traceability of material.
- We are teaching college kids how to sequence genes.

The Future of the Internet

There is a lot of attack talk

- The Internet itself is warm and fuzzy and it is rather astonishing that it took so long for viruses to develop after the Internet existed for years vulnerable to attacks.
- There is something very powerful about the Internet. Even though mainstream experience is trivial.
- While there is the dark picture there are also signs of hope such as the tools to circumvent government control.

Positive Thoughts about the Future

- There is something very powerful here. Serious contentions arise, but that is not the mainstream experience.
- The good future is the future of future makers. They must teach not to just learn stuff, but have them write questions so others get answers. And when someone makes bad stuff, stop them.
- It will be a future of makers and the ability to make things including civil and civic defense. It is not just learning but creating new stuff – write new questions to try to answer – at every layer. We do not have to rely on others to protect us.
VII. Concluding Comments

End Note

Nazli Choucri
Political Science Department, MIT

This Workshop represents the general “state of the art” as seen by the panelists, discussants, the direct participants, and other attendees. A major “thank you” to everyone for comments and contributions and, above all, for all making this event so interesting.

We can also consider the Workshop as something of a baseline against which to signal missing pieces, track future developments, and explore contingencies and possibilities. The discussion points to the new relevance of people in international relations, the apparent changes in power distributions, and the emergent complexities for cyberpolitics – at all levels and in all contexts.

As we move forward, we must address the following questions head on: Who controls cyberspace? What are emergent forms and uses of social media that influence—enable or impede—how people-power unfolds over time? What are the emergent contours of cyberpolitics? How will these affect power relations worldwide?

There are many more questions, to be sure, however, these are among the most pressing. Our plan is to address these in a follow-up workshop – taking into account matters of theory, methods, evidence and policy.
VIII. Poster Session: Contents

Accountability at the Application Layer
Wolff, Josephine, SM Candidate, Technology & Policy Program, MIT

Comparative Analysis of Cybersecurity Metrics to Develop New Hypotheses
Fisher, Dara, SM Candidate, ESD, MIT

Control through the Layers in the Chinese Internet
Hung, Shirley, Postdoctoral Associate, MIT

Coordinates of Cyber International Relations
Vaishnav, Chintan, Postdoctoral Associate, MIT

Cost-benefit Analysis of CERT’s International Cooperation Activities Focusing on Korean Case
Cho, Yiseul, SM Candidate, Technology & Policy Program, MIT

Cyber-enabled Loads & Capacities Methods
Young, Jr., William E., (LtCol, USAF), PhD Student, ESD, MIT

Cyber International Relations Theory: Assessing the State of Art
Reardon, Robert, Postdoctoral Associate, MIT

Cyberspace as Ungoverned Space Methods
Hoisington, Matthew, LLM Candidate, The Fletcher School of Law and Diplomacy

The Dynamics of Managing Undersea Cables Methods
Sechrist, Michael P., Project Manager, Harvard Kennedy School
Vaishnav, Chintan, Postdoctoral Associate, MIT

Escalation Management in Cyber Conflict: A Research Proposal
Reardon, Robert, Postdoctoral Associate, MIT
Establishing the Baseline: A Framework for Organizing National Cybersecurity Initiatives
Shukla, Aadya, Fellow, Harvard Kennedy School

Finding Order in a Contentious Internet
Sowell, Jesse, PhD Candidate, ESD, MIT

Learning Legal Principles to Enable Law at Cyber Speeds
Finlayson, Mark A., PhD, MIT

Representing Cyberspace Using Taxonomies and Meta-data Analysis
Cyber-enabled Loads & Capacities
Daw Elbait, Gihan, Postdoctoral Associate, MIT
Comparative Analysis of Cybersecurity Metrics to Develop New Hypotheses

D. Fisher, S. Madnick, N. Choucri, X. Li, and J. Ferrueda, Massachusetts Institute of Technology

Explorations in Cyber International Relations

People, Power, and CyberPolitics Workshop on MIT, December 7 and 8, 2011
Cyber in International Policy: A number of recent events have highlighted the significance of cyber in international policy.

- The attack on the Ukrainian power grid in 2015
- The WannaCry ransomware attack in 2017
- The Equifax data breach in 2017
- The SolarWinds hack in 2020

Cybersecurity is a critical concern for governments around the world, and the opportunities for cyber warfare are increasing.

Objective:
- To assess the state of the Art
- To explore the scope of the International Relations

Robert Reardon and Nazi Rezaei: Political Science, MIT

About the Authors:
- Robert Reardon is a professor of political science at MIT. His research focuses on international security.
- Nazi Rezaei is a graduate student at MIT. His research interests include international relations and cybersecurity.

Conclusion:
- Cybersecurity is a critical issue that requires international cooperation and coordination.
- The challenges of cybersecurity are complex and require a multidisciplinary approach.

Method:
- Qualitative and quantitative analysis
- Case studies and theoretical frameworks

Resources:
- United Nations Report on Cybersecurity
- International Telecommunication Union
- Global Cybersecurity Index

Assess the Strengths and Weaknesses of the
- Cybersecurity Framework

Explore the Scope of the International
- Cybersecurity

Key Characteristics of the Literature
- Why should theories be interested in Cyber?
### Author and Affiliation

**Contribution:**
- Papers published in the field of conflict management and resolution.
- Conducted research on the dynamics of conflict in various contexts.
- Collaborated with international experts to develop frameworks for conflict resolution.

**Books:**
- *Conflict Resolution in Cyber Conflict: Lessons from International Mediation*
- *Negotiation Strategies in Cybersecurity*

**Research Focus:**
- Cybersecurity and conflict management in digital environments.
- The role of technology in shaping conflict dynamics.

---

### Escalation Management

<table>
<thead>
<tr>
<th>Escalation Level</th>
<th>Conflict Resolution Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Establish clear communication channels</td>
</tr>
<tr>
<td>Medium</td>
<td>Implement conflict resolution protocols</td>
</tr>
<tr>
<td>High</td>
<td>Mediation or arbitration processes</td>
</tr>
</tbody>
</table>

---

### Research Framework

- **Objectives:**
  - To identify the root causes of conflict.
  - To develop strategies for conflict resolution.

- **Methods:**
  - Case studies of international conflicts.
  - Surveys and interviews with conflict mediators.

- **Findings:**
  - Escalation in cyber conflicts differs significantly from traditional conflicts.
  - Technological advancements play a crucial role in conflict resolution.

---

### Mitigation Strategies

- **Preventative Measures:**
  - Establishing a clear line of communication.
  - Conducting regular cybersecurity audits.

- **Response Strategies:**
  - Deploying rapid response teams.
  - Implementing incident response plans.

---

### Conclusion

- Escalation in cyber conflicts requires a multidisciplinary approach.
- Collaboration between governments, private sectors, and international organizations is essential.

---

### References

1. Robert Reardon, *CPR Postdoctoral Associates: Political Science MIT*
2. *Explorations in Cyber Conflict Management in Cyber Conflict*

Establishing the Baseline: A Framework for Organizing National Cybersecurity Initiatives

Aadya Shukla, Science, Technology and Public Policy Fellow

1. BACKGROUND

Policy making needs interoperation.

A clear understanding and communication of stakeholders' concerns across both domestic and international boundaries is a must.

Multiplicity of standards, guidelines and frameworks makes interoperability difficult.

- The UN issued resolution 50/135 on combating criminal misuse of Information Technologies (2000).
- Council of Europe Draft on Cybersecurity (1999).

2. PROBLEM STATEMENT

An integrated framework to characterize various strategies embodied in various national and international strategies is missing from the domain.

Therefore, it is hard to answer the following questions:

1. What are the specific and generic concerns of the stakeholders in cyberspace?
2. How do nation states balance their domestic priorities against need to comply with international guidelines?
3. How successful a particular initiative is against a specific type of cyber concern?
4. How does a national strategy scale up with change in cyber priorities?
5. What can be learned from other national initiatives?

3. APPROACH

Apply Meta-modelling technique (used in Software Engineering and AI) to design the required Integrated Framework.

What is Meta-modelling: Model of models.

Meta-modelling: Higher level abstraction to represent observed or inspected behavior of a real world phenomenon constrained by different contexts.

MODEL LEVEL (MS) METAMODEL LEVEL (MML)

If the task were to characterize the phenomenon of malware, then we can use meta level constructs (Concept, Property and Relationship), to have a model of models for all malware types.

4. SOLUTION

A light weight metamodel as an integrated framework for cyber strategies to establish the taxonomy:

Separate models for different types of cyber strategies (i.e., Competent, Guideline, Regulation).

Model component Classes:

- 'Actor' roles and categories of stakeholders (for example: ENISA is an instance of an actor in a role 'policy-owner').
- 'Scope' class defines boundaries of relevance; geographical (national, regional, international), application (crime, security, commerce, society).
- Technical (hardware, software, network).
- 'Priority' defines weight of different cyber concerns, per cyber strategy.
- Protocol defines processes, documents and nodes (human & machine) required to deploy a given cyber strategy.

5. UTILITY OF SOLUTION

National (Dutch, German and British) and regional cyber strategy (EU) were analyzed to enable better characterization of these initiatives.

Comparison of the EU Model with the rest demonstrates that evolution of regional strategy and national strategies of the members of the regional alliances happens at different scales.

Comparison of national initiatives, highlights further categories required for interoperability and improvements among nation states.

A clear way to separate the generic and specific cyber concerns of nation states.

Meta-modelling can be used to aggregate initiatives by cyber concerns to identify partners and allies in cyberspace.

Helps to decipher cyber strategy initiatives in a technology independent manner.

6. CONCLUSIONS

1. UNDERSTANDING YOUR OWN TURF IS NOT ENOUGH

Fluid international boundaries and asymmetric nature of threat in cyberspace, requires policy level interoperability in a wider context. Our metamodeling approach allows a collective, consistent, dynamic and systematic understanding by adding new models to the framework.

2. PRACTICAL APPLICATION

Meta-modelling will be used in building a feature-based online tool to assist new researchers, policymakers interested in understanding the domain.

ACKNOWLEDGEMENT

- Prof. V. Narayanan & Prof. N. Crockett
- ERC Consortium Explorations of Cyber International Relations, a Joint Harvard MIT Project funded by the Department of Defense.

Minerva Research Project at MIT & Harvard Explorations in Cyber International Relations

This work is funded by the Office of Naval Research under award number N00014091029. Any opinions, findings, and conclusions or recommendations expressed here are those of the author and do not necessarily reflect the views of the Office of Naval Research.
Acknowledgement

Summary

Results

Methods

Problem

Current Activities

Research Goals

No activity

Researched goals

Gihan Daw El Ejdab, PhD

Representing Cyberspaces using Taxonomies and Metadata Analyses
PARTICIPANTS

Poster Session and Workshop

Bruce Bakis
Principal Cyber Security Engineer
MITRE Corporation

David Beaver
Associate Professor
Linguistics Department
University of Texas at Austin

Adam Berinsky
Associate Professor of Political Science
Director, Political Experiments Research Lab
Massachusetts Institute of Technology

Marjory Blumenthal
Associate Provost
Georgetown University

Peter Brecke
Assistant Dean for Information Technology
Ivan Allen College of Liberal Arts
Associate Professor
Sam Nunn School of International Affairs,
Georgia Institute of Technology

Joel Brenner
Of Counsel
Cooley LLP

José Campos
Director
Microsoft Corporation

James Caulfield
Director
Operational Intelligence, Internet and Directory Services Group
Federal Reserve Bank of Boston

Kevin Cavanaugh
Vice President, Messaging and Collaboration
IBM Software Group

Yiseul Cho
Masters Candidate
Technology Policy Program
School of Engineering
Massachusetts Institute of Technology

Nazli Choucri
Professor of Political Science
Associate Director
Technology and Development Program
Massachusetts Institute of Technology
Principal Investigator, Explorations in Cyber International Relations (ECIR)

Claudio Cioffi-Revilla
Professor of Computational Social Science
George Mason University

David Clark
Senior Research Scientist
Computer Science and Artificial Intelligence Laboratory
Massachusetts Institute of Technology
Charles Cogan
Associate
International Security Program,
Belfer Center for Science & International Affairs
Harvard Kennedy School

Gihan Daw Elbait
Postdoctoral Associate
Department of Political Science
Massachusetts Institute of Technology

Chris Demchak
Associate Professor
Strategic Researcher
Strategic Research Department
U.S. Naval War College

James Dougherty
Adjunct Senior Fellow for Business and Foreign Policy
Council on Foreign Relations

Mark Edington
Executive Director
Harvard Decision Science Laboratory
Harvard University

Scott Farr
Commander, United States Navy
National Security Fellow
Harvard Kennedy School

Mark Finlayson
Doctoral Candidate
Electrical Engineering and Computer Science
Massachusetts Institute of Technology

Dara Fisher
Graduate Student
Technology and Policy Program
School of Engineering
Massachusetts Institute of Technology

Jane Fountain
Professor of Political Science and Public Policy
Adjunct Professor of Computer Science
University of Massachusetts Amherst

Archon Fung
Ford Foundation Professor of Diplomacy and Citizenship
Harvard Kennedy School of Government

Dan Geer
Chief Information Security Officer
In-Q-Tel

Firas Glaiel
Graduate Student
Engineering Systems Division
Massachusetts Institute of Technology
Principal Software Engineer
Raytheon Network Centric Systems

Michael Glennon
Professor of International Law
The Fletcher School of Law and Diplomacy

Daniel Goldsmith
Principal Consultant
PA Consulting

Phillip Hallam-Baker
Internet Security Protocol Architect
Comodo
Fergus Hanson
Research Fellow and Deputy Editor
_The Interpreter_
Lowy Institute/Georgetown University

Melissa Hathaway
Senior Advisor
Explorations in Cyber International Relations
Belfer Center for Science & International Affairs
Harvard Kennedy School
President, Hathaway Global Strategies LLC

Matthew Hoisington
LL.M. Student
Fletcher School of Law and Diplomacy

Shirley Hung
Postdoctoral Associate
Computer Science and Artificial Intelligence Laboratory
Massachusetts Institute of Technology

Roger Hurwitz
Research Scientist
Computer Science and Artificial Intelligence Laboratory
Massachusetts Institute of Technology

Joseph Kelly
Chief, Cyber Intelligence
Office of the Under Secretary
U.S. Department of Defense

Lucas Kello
Research Fellow
Belfer Center for Science & International Affairs
Harvard Kennedy School

Gary King
Albert J. Weatherhead III University Professor
Department of Government
Harvard University

Gary Kollmorgen
President/CEO
GSK Inc.
Contractor Support Office of Naval Research

Robert Laubacher
Research Scientist
Associate Director, Center for Collective Intelligence
Massachusetts Institute of Technology

Chappell Lawson
Associate Professor of Political Science
Director of the MIT International Science and Technology Initiatives (MISTI)
Secretary of the Faculty
Massachusetts Institute of Technology

Herb Lin
Chief Scientist
Computer Science and Telecommunications Board, National Research Council of the National Academies

Stuart Madnick
John Norris Maguire Professor of Information Technology, Sloan School of Management
Professor of Engineering Systems, School of Engineering
Massachusetts Institute of Technology
Jessica Malekos-Smith  
Undergraduate Student  
Wellesley College  
Cadet, U.S. Air Force Reserve Officer Training Corps, Massachusetts Institute of Technology

John Mallery  
Research Scientist  
Computer Science & Artificial Intelligence Laboratory  
Massachusetts Institute of Technology

Tim Maurer  
Non-resident Fellow  
Global Public Policy Institute

William McClane  
National Security Fellow  
Harvard Kennedy School

Vivek Mohan  
Fellow in Information and Communications Technology Public Policy  
Belfer Center for Science & International Affairs  
Harvard Kennedy School

Allen Moulton  
Research Scientist  
Center for Technology, Policy, and Industrial Development  
Massachusetts Institute of Technology

Venkatesh “Venky” Narayananuriti  
Director, Science, Technology and Public Policy Program, Belfer Center for Science and International Affairs  
Benjamin Peirce Professor of Technology and Public Policy  
Harvard Kennedy School  
Professor of Physics  
Harvard University

Joseph S. Nye, Jr.  
Harvard University Distinguished Service Professor  
Harvard Kennedy School

Olumide Longe  
Fellow  
MISTI Initiatives  
Massachusetts Institute of Technology

Taylor Owen  
Banting Postdoctoral Fellow  
Liu Institute for Global Issues  
University of British Columbia

Robert Pavelko  
Commander, 21st Space Operations Squadron, Vandenberg Air Force Base, California  
United States Air Force Academy

David Palés  
Fellow, Advanced Study Program  
Massachusetts Institute of Technology

Larry Pang  
Undergraduate Student  
Sloan School of Management  
Massachusetts Institute of Technology
Thomas Quinn
Senior Vice President and Chief Information Security Officer
State Street

John Randell
Program Officer for Science Policy
Associate Director for Science Policy Initiatives
American Academy of Arts and Sciences

Noah Rayman
Undergraduate Student
Harvard University

Robert Reardon
Postdoctoral Associate
Explorations in Cyber International Relations
Massachusetts Institute of Technology

David Robinson
Knight Law & Media Scholar
Information Society Project
Yale Law School

David Sacko
Professor of Political Science
US Air Force Academy

Masroor Sajid
Fellow, Advanced Study Program
Science, Technology and Society
Massachusetts Institute of Technology

Harvey Sapolsky
Professor of Public Policy and Organization, Emeritus
Massachusetts Institute of Technology

Mark Schonfeld, Esq.
Partner
Burns & Levinson LLP

Michael Sechrist
Program Manager
Explorations in Cyber International Relations
Belfer Center's Science, Technology, and Public Policy Program
Harvard Kennedy School

Adam Segal
Ira A. Lipman Senior Fellow
Counterterrorism and National Security Studies Council on Foreign Relations

Eugene Skolnikoff
Professor of Political Science Emeritus
Massachusetts Institute of Technology

Aadya Shukla
Fellow
Science, Technology and Public Policy Program
Belfer Center for Science and International Affairs
Harvard Kennedy School

Michael Siegel
Principal Research Scientist
Sloan School of Management
Massachusetts Institute of Technology

Evann Smith
Doctoral Candidate
Department of Government
Harvard University

Gordon Smith
Executive Director, Centre for Global Studies, Adjunct Professor of Political Science
University of Victoria
Jesse Sowell  
Doctoral Candidate  
Engineering System Division; Advanced Network Architecture Group, Computer Science and Artificial Intelligence Laboratory  
Massachusetts Institute of Technology

Robin Staffin  
Director, Basic Research in the Office of Assistant Secretary of Defense for Research and Engineering  
U.S. Department of Defense

Jessica Stern  
Writer  
Faculty Affiliate  
Belfer Center for Science and International Affairs  
Harvard University

Tyson Storch  
Business Development Manager  
Microsoft

Zachary Tumin  
Harvard Kennedy School  
Special Project Assistant, Science, Technology and Public Policy Program Director  
Belfer Center for Science and International Affairs  
Harvard Kennedy School

Chintan Vaishnav  
Postdoctoral Associate  
Department of Political Science  
Massachusetts Institute of Technology

Mitzi Wertheim  
Professor of Practice for Sustainability, Enterprises & Social Networks  
Cebrowski Institute  
Naval Postgraduate School  
Director  
The Energy Conversation

Richard Wang  
Director, MIT Information Quality Program  
Co-director, Total Data Quality Management Program at MIT  
University Professor, University of Arkansas at Little Rock

Josephine Wolff  
Graduate Student  
Technology & Policy Program  
Massachusetts Institute of Technology

William Young  
PhD Student  
School of Engineering  
Massachusetts Institute of Technology  
Lieutenant Colonel, USAF

Dorothy Zinberg  
Lecturer in Public Policy  
Senior Research Associate  
Belfer Center for Science and International Affairs  
Harvard University

Jonathan Zittrain  
Professor of Law  
Harvard Law School and Harvard Kennedy School  
Professor of Computer Science  
Harvard School of Engineering and Applied Sciences  
Co-Founder and Faculty Co-Director  
Berkman Center for Internet and Society
Ethan Zuckerman
Principal Research Scientist
Media Laboratory
Massachusetts Institute of Technology

1 Ethan Zuckerman is also an ECIR Session XX Panelist. See the session summary for his remarks.
2 http://www.ethanzuckerman.com/blog/2011/01/12/what-if-tunisia-had-a-revolution-but-nobody-watched/
4 http://thedata.org/
5 http://techcrunch.com/2011/10/17/twitter-is-at-250-million-tweets-per-day/
6 http://www.crimsonhexagon.com/
7 http://cohemetrix.memphis.edu/cohemetrixpr/index.html
8 Evann Smith framed this theory in a very similar fashion in ECIR Workshop Session 5. See Session Summary.
10 Climate CoLab: http://climatecolab.org; MIT Center for Collective Intelligence: http://cci.mit.edu/
12 See http://igem.org/Main_Page for more information on iGEM.