

Creating the Policy and Legal Framework for a Location-Enabled Society

Co-organizers:

Center for Geographic Analysis, IQSS, Harvard University
Centre for Spatial Law and Policy, Washington, DC
Berkman Center for Internet and Society, Harvard University
Belfer Center for Science and International Affairs, Harvard Kennedy School

Co-sponsor:

The United States Geospatial Intelligence Foundation

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**Location: Tsai Auditorium, CGIS Building South, Room S010
Address: 1730 Cambridge St., Cambridge, MA 02138**

Location matters. Energy, sustainable agriculture, biodiversity, natural hazards, traffic and transportation, crime and political instability, water quality and availability, climate change, migration and urbanization – all key issues of the 21st century – have a location component. Critical geographic thinking, understanding and reasoning are essential skills for modern societies, and geospatial technologies for location based data collection, management, analysis and visualization have developed rapidly in recent decades. Today, these technologies are widely applied in routine operations in large corporations, entrepreneurial businesses, government agencies, non-governmental organizations (NGOs) and the social media of our daily lives. They save cost, improve efficiency, increase transparency, enhance communication, and help solve problems. Location-enabled devices are weaving “smart grids” and building “smart cities;” they allow people to discover a friend in a shopping mall, catch a bus at its next stop, check surrounding air quality while walking down a street, or avoid a rain storm on a tourist route – now or in the near future. And increasingly they allow those who provide services to track, whether we are walking past stores on the street or seeking help in a natural disaster.

Such deep penetration of the geospatial technologies into people’s daily lives, however, generates policy and legal concerns with privacy, ownership rights of location information, national and homeland security, uncertainty about government funding and regulation, and more. These issues are relatively new to the academic community and to human societies at large. Technology developers, industries, legal experts, policy makers and citizen rights advocates would be well served in talking to one another as they grapple with the opportunities and challenges of a location-enabled society.

Thursday, May 2, 2013**Room CGIS S010****1:00 PM - 1:30 PM***Registration***1:30 PM - 1:40 PM****Welcome & Introduction***Peter Bol & Kevin Pomfret***1:40 PM - 2:20 PM****Be Careful What You Ask For: Reconciling a Global Internet and Local Law***Jonathan Zittrain**Moderator: Peter Bol***2:20 PM - 3:30 PM****Geospatial and Developing Economies***Marcia Castro, Ron Garan, Ken Westrick, Lee Schwartz**Moderator: Calestous Juma***3:30 PM - 3:50 PM***Coffee Break***3:50 PM - 5:00 PM****Taking Society's Pulse in Real-Time***Ben Lewis, Todd Mostak, Jeff Blossom, Chris Tucker**Moderator: Kirk Goldsberry***5:00 PM - 5:30 PM****NSF and NIH Research on Geographic Data Confidentiality and Privacy***Doug Richardson**Moderator: Peter Bol***5:30 PM - 6:30 PM***Reception***Friday, May 3, 2013****Room CGIS S010****8:30 AM - 9:00 AM***Registration and breakfast***9:00 AM - 9:10 AM****Welcome & Introduction***Peter Bol & Kevin Pomfret***9:10 AM - 9:30 AM****Managing Change by Technology Darwinism***Jeff Harris**Moderator: Peter Bol*

9:30 AM - 9:50 AM

UN-Global Geospatial Information Management (UNGGIM): Legal and Policy Challenges

Greg Scott

Moderator: Kevin Pomfret

9:50 AM - 11:00 AM

Privacy Issues Associated with Location and Geospatial information

Kirk Goldsberry, Dave DiBiase, Jeremy Crampton, Nicolas Oreskovic, Sarah Williams

Moderator: Kevin Pomfret

11:00 AM - 11:10 AM

Coffee Break

11:10 AM - 12:20 PM

Spatial Data Infrastructures: Laying the Foundation

Matt Gentile, Latanya Sweeney, Bernd Resch, Chris Tucker, Jerry Mechling, Raj Singh

Moderator: Zachary Tumin

12:20 PM - 1:20 PM

Lunch & Poster Competition

1:20 PM - 2:30 PM

The Internet of Things: Policy and Legal Frameworks Necessary to support Smart Grid/Intelligent Transportation Systems/Smart Cities

Kipp Jones, Valerie Shuman, Kara Selke, Geoff Zeiss, Jukka-Pekka Onnela, Meraj Mirza

Moderator: Stephen Ervin

2:30 PM - 3:40 PM

The Law and Earth Observation: Military, Commercial, Environmental and Scientific Perspectives

Nancy Colleton, Dan Jablonsky, Keith Masback, Charlie Hale

Moderator: Jeff Harris

3:40 PM - 3:50 PM

Coffee Break

3:50 PM - 5:00 PM

Role of Government in a Location-Enabled Society

Steve Goldsmith, Nigel Jacob, Ebele Okobi, Sandy Pentland

Moderator: Urs Gasser

5:00 PM - 5:30 PM

Closing Remarks: Geospatial Science, Technology and Innovation

Calestous Juma

Moderator: Kevin Pomfret

5:30 PM - 5:40 PM

Poster Awards

Peter Bol

5:40 PM - 6:30 PM

Reception

Be Careful What You Ask For: Reconciling a Global Internet and Local Law

Jonathan Zittrain

Abstract: As the Internet becomes part of daily living rather than a place to visit, its rough edges are smoothed and its extremes tamed by sovereigns wanting to protect consumers, prevent network resource abuse, and eliminate speech deemed harmful. The tools are now within reach to permit sovereigns with competing rulesets to play down their differences - whether by countenancing global privatization of some Internet governance issues through organizations like ICANN, coming to new international agreements on substance and procedure to reduce the friction caused by transborder data flows, or by a "live and let live" set of localization technologies to shape the Internet to suit the respective societies it touches. These shifts will help ease the tension between the certitudes that the Internet is global, while the imposition of regulation is almost always local. Such cures for the longstanding dilemmas of Internet jurisdiction and governance eliminate the originally cherished aspects of a global Internet as well - urging us to consider the iatrogenic effects of bulldozing online activity to conform more to the boundaries of the physical world that preceded it, and explaining why, in the United States and elsewhere, there are contradictory policies emerging about the Internet's future.

*Jonathan Zittrain is Professor of Law at Harvard Law School and the Harvard Kennedy School of Government, Professor of Computer Science at the Harvard School of Engineering and Applied Sciences, and co-founder of the Berkman Center for Internet & Society. His research interests include battles for control of digital property and content, cryptography, electronic privacy, the roles of intermediaries within Internet architecture, human computing, and the useful and unobtrusive deployment of technology in education. He performed the first large-scale tests of Internet filtering in China and Saudi Arabia, and as part of the OpenNet Initiative co-edited a series of studies of Internet filtering by national governments: *Access Denied: The Practice and Policy of Global Internet Filtering*; *Access Controlled: The Shaping of Power, Rights, and Rule in Cyberspace*; and *Access Contested: Security, Identity, and Resistance in Asian Cyberspace*.*

Geospatial and Developing Economies

Marcia Castro, Ronald Garan, Ken Westrick, Lee Schwartz

Abstract: What is the current role and play of geospatial technologies in strategy and prospects for developing economies? How can these technologies accelerate progress? What are issues and possibilities on the path forward - and what are the requirements for success? This panel will explore current examples, efforts, and potentials for geospatial technologies to make progress in this critical global arena.

Marcia Castro is Associate Professor of Demography in the Department of Global Health and Population, Harvard School of Public Health, and Associate Faculty of the Harvard University Center for the Environment. Her research focuses on the development and use of multidisciplinary approaches, combining data from different sources, to identify the determinants of malaria transmission in different ecological settings, providing evidence for the improvement of current control policies, and the development of new ones. Other areas of research include expansion of the Brazilian Amazon frontier and the impacts of large-scale development projects implemented in the region; use of spatial analysis in the Social Sciences; population dynamics and mortality models; population displacement associated with development projects and climate change; and modeling the impact of extreme climatic events on the transmission of malaria in the Amazon. Castro has applied geographical information systems, remote sensing, and spatial statistics to her research, and proposed novel methods in spatial analysis.

Ron Garan is a highly decorated Fighter Pilot and Test Pilot, Explorer, Entrepreneur and Humanitarian who believes that appropriately designed and targeted social enterprise can solve many of the problems facing our world. He is a current NASA astronaut who has traveled 71,075,867 miles in 2,842 orbits of our planet. Ron's last assignment was in NASA's Open Innovation Initiative, which seeks to increase openness, transparency, collaboration, and innovation within government. Working in partnership with the US Agency for International Development (USAID), Ron is leading an effort called Unity Node to develop a universal, open source, collaborative platform to enable humanitarian organizations around the world to work together toward their common goals and is assisting USAID to establish an Advanced Research Projects Agency for Development program.

Ken Westrick is a business leader with broad experience and background in renewable energy, weather & climate, sustainable technologies, especially as applied in an international context. His specialties are renewable energy strategies, weather and climate risks, renewable energy resources, weather and hydrological modeling methods, climate change effects on RE. He is co-founder and CTO at REsurety, Inc., founder and CEO at Westeva, and board member of the Latin American and Caribbean Council On Renewable Energy.

Lee Schwartz is The Geographer at the US Dept of State. He also is the director of the State Department's Office of the Geographer and Global Issues. Schwartz's office has centered its efforts on emergency responses to humanitarian disasters, which involve digital mapping, imagery analysis and fieldwork operations designed to deliver relief to vulnerable refugees and displaced persons. He also leads a program designed to build partnerships to support the use GIS&T for sustainable development activities in Africa.

Taking Society's Pulse in Real-Time

Ben Lewis, Todd Mostak, Jeff Blossom, Chris Tucker

Abstract: TweetMap is a web-based platform for real-time visualization and analysis of geo-referenced tweets. It is built on the MapD, a massively parallel database platform, and WorldMap, both are under rapid development. Through TweetMap, anybody can instantaneously see the distribution and intensity of tweets filtered by any keyword in space and time. What is the value of such a platform in the hands of researchers, decision makers, service providers, or criminals?

Ben Lewis is a Senior GIS Specialist at the Center for Geographic Analysis. He is system architect and project manager for WorldMap, an open source infrastructure that supports collaborative research centered around geospatial information. Before joining Harvard in 2007 Ben was a project manager with Advanced Technology Solutions of Pennsylvania, where he led the company in adopting platform-independent approaches to GIS system development. Ben studied Chinese at the University of Wisconsin and has a Masters in Planning from the University of Pennsylvania. After Penn, Ben worked at the U.C Berkeley GIS Lab, started the GIS group for the transportation engineering firm McCormick Taylor, and coordinated the Land Acquisition Mapping System for the South Florida Water Management District. Ben is especially

interested in technologies that lower the barrier to GIS access.

Todd Mostak currently works as a Research Programmer at MIT's Computer Science and Artificial Intelligence Laboratory, working in the database research group. Seeking adventure upon finishing his undergrad, Todd moved to the Middle East, spending two years in Syria and Egypt teaching English, studying Arabic and eventually working as a translator for an Egyptian newspaper. He then completed his MA in Middle East Studies at Harvard University, afterwards taking a position as a Research Fellow at Harvard's Kennedy School of Government, focusing on the analysis of Islamism using forum and social media datasets. The impetus to build MapD came from how slow he found conventional GIS tools to spatially aggregate and analyze large Twitter datasets from the Middle East. He hopes to continue building functionality into MapD, creating a general-purpose platform that will allow real-time exploration, analysis and visualization of large datasets.

Jeff Blossom is a Senior GIS Specialist at the CGA. He has 17 years working in the GIS industry as a technician, analyst, developer, and manager. Prior to joining the CGA, Jeff was the GIS Photogrammetry Administrator for the City and County of Denver, and served as Chairman of Denver's GIS Steering Committee. He is especially interested in developing tools, teaching methods, and maps using geographic information that can be used by any student or professional to enhance their work.

Chris Tucker is active in the geospatial industry and the US national security community, and as Principal of Yale House Ventures, manages a portfolio of technology startups and social ventures. He was the founding chief strategic officer of In-Q-Tel, the CIA's venture capital fund, charged with developing In-Q-Tel's overall strategy for tackling the priority information technologies problems of the agency. Tucker is the founder of the MapStory Foundation which seeks to develop an online social media channel/platform that enables a global community of experts to "crowd source" socio-cultural data within a geospatial and temporal framework, and to publish "MapStories" as spatio-temporally enabled narratives. Tucker serves on the board of directors of the Open Geospatial Consortium and the US Geospatial Intelligence Foundation. Tucker serves, or has served on Federal Advisory Committees such as the Defense Science Board's Intelligence Task Force and the United States Department of Interior's National Geospatial Advisory Committee.

NSF and NIH Research on Geographic Data Confidentiality and Privacy

Douglas Richardson

Abstract: This talk addresses the landscape of data confidentiality research challenges and opportunities generated by three inter-related AAG research initiatives: 1) Addressing Challenges For Geospatial Data-Intensive Research Communities: Research on Unique Confidentiality Risks & Geospatial Data Sharing within a Virtual Data Enclave (funded by NSF); 2) the AAG Initiative for an NIH-wide Geospatial Infrastructure for health research (funded by NIH and AAG); and 3) Geospatial Frontiers of Health and Social Environments (funded by NIH). These AAG initiatives have generated linked and interactive data confidentiality research needs and agendas in the rapidly expanding domains of spatial technology, spatio-temporal data generation, and related research methods. They have also created an increased awareness by health and biomedical researchers as well as by geographers of the core role that geography and GIScience plays in addressing global health and sustainability needs, both in research and in practice.

Douglas Richardson is the Executive Director of the Association of American Geographers (AAG). During the past ten years, he led a highly successful organizational renewal of the AAG and has built strong academic, research, publishing, and financial foundations for the organization's future. Prior to joining the AAG, Dr. Richardson founded and for

18 years was the president of GeoResearch, Inc., a private-sector scientific research company specializing in geographic science and technology, including geographic information science and systems (GIS), spatial modeling, and Global Positioning Systems (GPS). GeoResearch developed and patented the world's first real-time interactive GPS/GIS technologies, leading to far-reaching changes in the ways in which geographic information is collected, mapped, integrated, and used within geography, as well as in society at large. The technologies and methods pioneered by GeoResearch are now at the heart of a wide array of real-time interactive mapping, navigation, location-based business, geographic research, mobile computing, military operations, and large-scale operations management applications of most major industries and governments. Richardson sold his company and its core patents in 1998. Richardson continues to conduct research and publish across multiple dimensions of geography, ranging from the GISciences to the GeoHumanities, and from international health research to interactions between science, innovation, and human rights. He holds a Bachelor's degree from the University of Michigan and a PhD in Geography from Michigan State University. He has served on dozens of NGO and corporate boards of directors, and currently is a member of the National Geospatial Advisory Committee.



Managing Change by Technology Darwinism

Jeff Harris

Abstract: Increasingly the world is now experiencing a productivity revolution where the industrial internet now leverages the power of vast storage, communication and computational resources to connect machines embedded with sensors and sophisticated software to other machines and to us so data can be extracted, made sense of, and used to reveal new meaning and understanding where it did not exist before. Increasingly machines will have the analytical intelligence to self-diagnose and self-correct. They will be able to help deliver the right information to the right people, in real time, producing better business and social outcomes. Additionally, harnessing the power and availability of this information technology with skilled data analysts will enable the delivery of improved big data analytics faster and at lower costs. That said; the challenge will be to determine how to best align the technology with proven repeatable processes and skilled analysts to achieve world-class operational performance. This will drive a need for massive culture change as we struggle across both generational and private - government boundaries to understand the 'the how, the speed and the why' of massive technology empowerment and best how people, society and existing processes adapt. This change will not happen overnight. People and their governments will struggle to establish new rules of the road in both law and regulation as society works to best understand the risks and rewards for widespread adoption of technologies that are infringing on the traditional boundaries of personal privacy. Learned behaviors both good and bad will be an important part of this evolution.

Jeffrey Harris has contributed to US national security in both Government and Industry for 35 years where he has fostered new technologies, programs and capabilities that have contributed significantly to US national security capabilities. He currently consults with industry and the US Government. He served as President of Lockheed Martin Missiles and Space and President of Lockheed Martin Special Programs. He served as President of Space Imaging, the first company to commercially provide high-resolution satellite imagery and information products of the Earth for cost-effective solutions to today's global business needs. He has served as Assistant Secretary of the Air Force for Space; Director, National Reconnaissance Office,

and Associate Executive Director of the Intelligence Community, providing direct support to both the Secretary of Defense and the Director of Central Intelligence. Mr. Harris has received numerous awards, most notably the National Intelligence Distinguished Service Medal, the CIA Distinguished Service Medal, the NRO Medal for Distinguished Service, the US GeoSpatial Foundation Lifetime Achievement Award, Aviation Week Laureate Citation and the James V. Hartinger Award for military space achievement. He is a member of the Commander STRATCOM Strategic Advisory Group, the United States Energy Security Council, the Sandia Intelligence Advisory Panel, National Security Agency Advisory Board (Acquisition), the US Geospatial Foundation Board, Centre for Spatial Law and Policy Advisory Board and is the Chairman of Open Geospatial Consortium Board.

UN-Global Geospatial Information Management (UNGGIM): Legal and Policy Challenges

Greg Scott

Abstract: The United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) was established in July 2011 to be the official UN consultative inter-governmental mechanism on geospatial information. It plays a leading role as a coordinating point to ensure that Member States are able to set the agenda for the development of global geospatial information, whilst promoting its use to meet key global challenges. Geospatial information is now being used by governments, organisations and individuals across the globe to support modelling and analysis to understand complex situations, enable effective decision making, drive innovation and efficiencies, and underpin economic growth. The global recognition of the power of accurate and reliable geospatial information has resulted in world leaders wanting to use this data to tackle global issues, including sustainable development. While the geospatial community recognises that this is technically achievable in a location-enabled society, the legal and policy frameworks required to facilitate the progress of such a society are not developing in a consistent way and are falling well behind technological developments. Member States are at different stages of geospatial evolution and maturity in terms of consistent and transparent legal and policy frameworks. In this regard, UN-GGIM is assisting national governments in addressing very real challenges in areas such as data privacy, licensing, ownership, access, liability, quality,

intellectual property, national security, etc. and their role in these complex processes. This presentation will discuss some of these legal and policy challenges.

Greg Scott is Inter-Regional Advisor on Global Geospatial Information Management in the United Nations Statistics Division (UNSD). UNSD is mandated to provide Secretariat support to the recently established United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM), an inter-governmental mechanism created by the Economic and Social Council (ECOSOC) in July 2011. In his role within the Secretariat, Greg provides high level strategic policy, technical and procedural advice and coordination in the implementation of UN-GGIM initiatives, particularly with the GGIM Bureau and Member States of the United Nations, and related International Organizations involved in national, regional and global geospatial information management.

Privacy Issues Associated with Location and Geospatial information

Kirk Goldsberry, Dave DiBiase, Jeremy Crampton, Nicolas Oreskovic, Sarah Williams

Abstract: Technology has resulted in a growing number of ways for an individual's location to be collected and shared. This information can be used to provide a number of economic, societal and governmental benefits. However, it also raises questions as to what is privacy from a location standpoint and what responsibility do governments, industry and individuals have with respect to such privacy concerns. The panel has been designed to discuss this complicated and important topic from a variety of perspectives.

Kirk Goldsberry is a Visiting Scholar at the CGA. Since 2011 his core task with the CGA has been to integrate new spatial reasoning curricula into existing Harvard courses. Prior to joining the CGA he was an assistant professor of Geography at Michigan State University. He has several years of teaching experience focusing on Geography, GIS, Cartography, and Data Visualization. Kirk earned his Ph.D. in Geography from UC-Santa Barbara in 2007. His research interests include both cognitive aspects of GIScience and the applied integration of GIS, urban geography, and public health.

David DiBiase leads the Education Team within Esri's Industry Solutions group. The Team promotes GIS use and spatial thinking in higher education, schools, and youth groups worldwide. Before join-

ing Esri, David founded and led the Penn State Online GIS Certificate and Masters degree programs. He served as lead editor of the U.S. Department of Labor's Geospatial Technology Competency Model and the GIS&T Body of Knowledge published by Association of American Geographers. He also led the NSF-funded "GIS Professional Ethics" project from 2008-2010, and continues to lead professional ethics workshops for Penn State Online.

Jeremy Crampton's work is on the cultural production of spatial identity. His recent work is on the political representation of space, especially through mapping and GIS. He is currently researching military intelligence and geographical intelligence (GEOINT) and its deployments of geography, mapping, and GIS. He is interested in national security, surveillance and state governmentality, and their enrollment of mapping and GIS as technologies of government. He has done historical geographies of map intelligence during World War I, and the US's first national intelligence agency during World War II, known as the OSS. In 2012 he was the recipient of the Woodward Fellowship in the History of Cartography.

Nicolas Oreskovic is a physician at Massachusetts General Hospital. His research interests are to better understand how physical space and design (the "built environment") affect and influence human health, especially energy balance and chronic disease, among both children and adults. His research has involved large database studies, survey studies, as well as clinical studies. He is currently the principal investigator on an NIH patient-oriented career development award that incorporates a clinical intervention assessing how adolescents use the built environment for daily physical activity. His work is multidisciplinary and seeks to foster collaboration among health researchers and design professionals such as architects and urban planners.

Sarah Williams is currently an Assistant Professor of Urban Planning and the Director of the Civic Data Design Lab Project at Massachusetts Institute of Technology's (MIT) School of Architecture and Planning School. The Civic Data Design Lab employs data visualization and mapping techniques to expose and communicate urban patterns and policy issues to broader audiences. Before coming to MIT Williams was Co-Director of the Spatial Information Design Lab at Columbia University's. Sarah has won numerous awards including being named top 25 planners in the technology and 2012 Game Changer by Metropolis Magazine. Her work is currently on view in the Museum of Modern Art (MoMA), New York.

Spatial Data Infrastructures: Laying the Foundation*Matt Gentile, Latanya Sweeney, Bernd Resch, Chris Tucker, Jerry Mechling, Raj Singh*

Abstract: Government agencies are the repositories of vast amounts of data, much of it tied to a location, an individual or both. This information is the foundation for creating a location-enabled society. However, sharing this data between government agencies has always been a challenge from a policy and legal standpoint. These issues have become even more important due to the increase in citizens becoming both direct users and data providers in this process. This panel will discuss these issues and suggest ways in which they can be addressed.

Matt Gentile is head of geospatial practice and principal at Deloitte Financial Advisory Services. He is a member of the National Geospatial Advisory Committee (NGAC), a committee that provides recommendations on federal geospatial policy and management issues and advice on development of the National Spatial Data Infrastructure (NSDI). Matt is a recognized thought leader and entrepreneur in the geospatial community, dedicating the past 16 years to working at the intersection of public policy and geospatial technology.

Latanya Sweeney is the Director of the Data Privacy Lab in IQSS at Harvard. As Professor of Government and Technology in Residence, she creates and uses technology to assess and solve societal, political and governance problems, and teaches others how to do the same. One focus area is data privacy, and she has published on Policy and Law: Identifiability of de-identified data. Dr. Sweeney's current research goal is to replace the 3 historical pillars of privacy (consent, notice, and de-identification) with new technology-powered mechanisms that jointly provide a privacy fabric appropriate for today's setting. The goal is to allow society to reap the benefits of emerging technologies while enjoying privacy protection.

Bernd Resch is Research Director (Live Geography) at University of Heidelberg, Research Affiliate at the MIT SENSEable City Lab (USA), Visiting Fellow at Harvard University (USA) and Lecturer at University of Salzburg (Austria). Bernd Resch did his PhD in the area of "Live Geography" (real-time monitoring of environmental geo-processes) together with University of Salzburg and MIT. His research interests revolve around environmental monitoring, crowd-sourcing methods, People

as Sensors, real-time analysis of urban dynamics, Sensor Fusion, interoperability in geo-sensor networks, web-based data analysis and geo-visualization techniques. He also serves an Editorial Board Member of the International Journal on Advances in Software and the Journal of Location-based Services, Co-chair of the Geoinformatics 2013 conference, Co-chair of the GEOProcessing conference, Co-organiser of the Young Researchers' Forum GIScience, and a member of the Development Team of the Bachelor/Master Programme of the Salzburg University of Applied Sciences.

Chris Tucker's bio is included above.

Jerry Mechling is a research vice president at Gartner Inc. From 1983 to 2011, he was a faculty member of the Harvard Kennedy School, where he taught degree-program courses on information management and founded Strategic Computing in the Public Sector, a research and executive-education program. A fellow of the National Academy of Public Administration and four-time winner of the Federal 100 Award, he was formerly a fellow of the Institute of Politics, an aide to the mayor of New York City and assistant administrator of the New York City Environmental Protection Administration, and director of Boston's Office of Management and Budget.

Raj Singh serves as a Director of Interoperability Programs for OGC. He manages multi-vendor software prototyping projects developing collaborative, interoperable spatial information ecosystems. He also shepherds OGC's mass market efforts to better align geospatial standards with the general IT industry. Currently, Raj is passionate about creating a global catalog of points of interest data, indexing and linking web data about every public and commercial place in the world in the OpenPOIs Registry. Past projects include efforts to improve information exchange in the building industry at early design stage, and the development of GeoRSS, Geosynchronization, and conformance testing procedures for OGC's web services and encoding standards. Raj has a PhD in Planning Information Systems and a Master's in City Planning from MIT.

The Internet of Things: Policy and Legal Frameworks Necessary to support Smart Grid/Intelligent Transportation Systems/Smart Cities*Kipp Jones, Valerie Shuman, Kara John, Geoff Zeiss, Jukka-Pekka Onnela, Meraj Mirza*

Abstract: Many predict that in the very near future we will see billions of devices connected to the internet. This "Internet of Things"

will provide the foundation Smart Grids and Intelligent Transportation Systems and other systems that will have numerous economic and societal benefits. The location component of this Big Data will be crucial in the mission-critical, real-time decisions required for such systems. However, there are a number of legal and policy issues that will need to be addressed in order for these systems to provide their expected value. This panel will discuss these technologies, their potential impact and why is important to begin address the legal and policy issues today.

Kipp Jones oversees the product group at Skyhook. As VP Product, he is deeply engaged in all aspects of the business, customers, policies and technology in the fast moving mobile location and location intelligence markets. Skyhook's products and services are utilized by many of the most well known mobile companies around the world, generating billions of location transactions each month. Kipp received his BS in Computer Science from the University of Nebraska as well as an MS and ABD in CS from Georgia Tech.

Valerie Shuman is the Principal at Shuman Consulting Group, LLC (SCG), a DBE-certified management consulting firm which she founded in 2009. At SCG, she partners with customers to deliver new products, new markets and new ventures by developing strategy, market intelligence, product management, and marketing. Ms. Shuman also serves as Vice President, Industry Programs for the Connected Vehicle Trade Association (CVTA), an international, non-profit trade association which advances the interests of organizations involved in vehicle communications. Her CVTA role is the latest in over two decades of partnering with global leaders to deliver ground-breaking new products and ventures in the Intelligent Transportation Systems (ITS) space. Since the inception of the industry, Ms. Shuman has led the establishment of new wireless and automotive telematics communities and technologies, national and international standards, and global cross-industry liaison efforts to enable safer, more efficient, and more convenient transportation.

Kara Selke is SVP of Strategic Partners and Privacy at StreetLight Data Inc. In this role, she is charged with licensing geospatial content and managing relationships with key strategic partners. In addition, Kara is responsible for the development and management of StreetLight's privacy policies and practices. Prior to joining StreetLight,

Kara served as SVP of Intellectual Property and Privacy for DMTI Spatial, the leading provider of geospatial business intelligence in Canada. Over her career, Kara has also held various positions at NAVTEQ including work in strategic development and emerging markets, and at Navitrak in strategic development and intelligent mapping for aviation. Kara has been an active participant in the development of geospatial policy in North America and internationally, is one of the founding members of the Centre For Spatial Law & Policy, a long time participant in ISO industry standards to support ITS and mapping, and is currently Vice-Chairman of ITS Canada. Kara holds a JD from Concord Law School, BA (Clark University), MA (Boston University) and a number of professional certifications including Certified Licensing Professional (CLP), and CIPP/E (Europe) from the International Association of Privacy Professionals.

Geoff Zeiss has more than 20 years experience in the geospatial software industry and 15 years experience developing enterprise geospatial solutions for the utilities, communications, and public works industries. His particular interests include the convergence of BIM, CAD, geospatial, and 3D; open source geospatial, and optimizing utility work flows to support smart grid. Currently Geoff is Principal at Between the Poles, a thought leadership consulting firm. .

Jukka-Pekka Onnela is an Assistant Professor in the Department of Biostatistics, Harvard University School of Public Health. He is interested in a broad range of theoretical and applied problems in network science. His current research focuses on statistical and mathematical analysis and modeling of social networks and their connection to human health; development of metrics and methods for network analysis; network theory; and online social systems and social media.

Meraj Mirza is a visiting professor at the Center for Geographic Analysis, currently conducting research on historical GIS of Makkah and Saudi Arabia using the WorldMap platform. Since 1975, Meraj has been affiliated with Umm Al-Qura University (UQU), Makkah (Mecca), Saudi Arabia. He is also an active associate of the Center of Research Excellence in Hajj and Omrah (HajjCORE), Umm Al-Qura University. In 1997, he was one of the initiators of the GIS/Remote Sensing unit in (UQU), which is the pioneer GIS unit in Saudi universities.

The Law and Earth Observation: Military, Commercial, Environmental and Scientific Perspectives

Nancy Colleton, Dan Jablonsky, Keith Masback, Charlie Hale

Abstract: Earth Observation - whether from space, air, sea or on the ground - is critical to deal with the increasingly complex issues mankind faces across the globe. Resolving such transnational issues will mean collecting, distributing and analyzing vast amounts of information from a variety of sensors. These sensors are owned and/or operated by government, the private sector, non-governmental organizations and increasingly citizens themselves. This panel will address the complex legal and policy issues required to collect and share this information across borders.

Nancy Colleton is a leader in environmental communication and information. As the president of the Institute for Global Environmental Strategies (IGES) she leads numerous initiatives that promote better understanding of the changing planet. Nancy has worked vigorously with senior-level government and industry executives to increase the awareness, value and use of Earth observations and to emphasize the need for a comprehensive strategy to ensure that citizens, business, and government at all levels have the environmental intelligence needed for improved decision making.

Dan Jablonsky serves as DigitalGlobe's Senior Vice President, General Counsel and Secretary. Prior to joining DigitalGlobe, he was a shareholder at Brownstein Hyatt Farber Schreck, LLP, a law firm, where he practiced corporate and securities law. Before joining Brownstein, Dan served as the Interim Co-General Counsel and Senior Corporate Counsel, Securities and M&A at Flextronics. He has handled financial fraud and insider trading cases as a member of the Division of Enforcement of the U.S. Securities and Exchange Commission, and practiced corporate and securities law with O'Melveny & Myers LLP. Dan served as an officer and nuclear engineer in the United States Navy.

Keith Masback is the Chief Executive Officer of the United States Geospatial Intelligence Foundation (USGIF). The Foundation promotes the geospatial intelligence (GEOINT) tradecraft and sustains a GEOINT Community among government, industry, academia, professional organizations and individuals. He is a member of NOAA's Advisory Committee on Commercial Remote Sensing and a former member of the Intelligence Task Force of the Defense Science Board.

Charlie Hale is a Policy Analyst at Google. He works on public policy and government affairs for Google's geo products (Maps & Earth) and Google[x], which includes the self-driving car project and Google Glass, among others. He is also Co-Founder at Global Health Corps, and a member of the Advisory Board at Envaya.

Role of Government in a Location-enabled society

Steve Goldsmith, Nigel Jacob, Ebele Okobi, Sandy Pentland

Abstract: The session will focus on the role of government as an enabler of strategic policy frameworks for location based services, data, and related issues. Roundtable participants will consider three different focal points for discussion: (1) conceptual strategies that can be used to foster relationships between government, industry, and citizens; (2) organizational approaches to leadership in the development of policies, norms, and laws around the risks and opportunities presented by geospatial data; and (3) existing and envisioned technical interventions including standards development, legal interoperability, considerations of privacy and security, and generation of frameworks of cooperation.

Stephen Goldsmith is the Daniel Paul Professor of the Practice of Government and the Director of the Innovations in American Government Program at Harvard's Kennedy School of Government. He currently directs the Mayoral Performance Analytics Initiative at Harvard, a project to highlight local government efforts to use new technologies that connect breakthroughs in the use of big data analytics with community input to reshape the relationship between government and citizen. He previously served as Deputy Mayor of New York and Mayor of Indianapolis, where he earned a reputation as one of the country's leaders in public-private partnerships, competition, and privatization. Stephen was also the chief domestic policy advisor to the George W. Bush campaign in 2000.

Nigel Jacob is the co-founder of New Urban Mechanics, board member at Code For America, Fellow at the Center for Advancement of Public Action at Bennington College, and a policy advisor at Boston City Hall. He is working to create a network of civic innovation laboratories that spans the globe and enables cities to collaborate around the development of new kinds of civic technologies. He specializes in development of public-private collaborations, civic innovation, civic software architecture and engineering, and research and development.

Ebele Okobi is Global Head of Yahoo!'s Business & Human Rights Program, where she leads Yahoo!'s efforts to promote privacy and free expression on the Internet, and works to identify innovative solutions to human rights challenges. Before joining Yahoo!, Ebele worked as a corporate lawyer at Davis Polk & Wardwell, an attorney fellow at Consumers Union, a director of Advisory Services at Catalyst and as a member of the Management Development Program at Nike's EMEA headquarters in Amsterdam, where she created marketing, corporate responsibility and business development strategy for Africa, NikeWomen and Nike Digital.

Alex "Sandy" Pentland directs MIT's Human Dynamics Laboratory and the MIT Media Lab Entrepreneurship Program, co-leads the World Economic Forum Big Data and Personal Data initiatives, and is a founding member of the Advisory Boards for Nissan, Motorola Mobility, and a variety of start-up firms. He has previously helped create and direct MIT's Media Laboratory, the Media Lab Asia laboratories at the Indian Institutes of Technology, and Strong Hospital's Center for Future Health. In 2012 Forbes named Sandy one of the 'seven most powerful data scientists in the world', along with Google founders and the CTO of the United States. He is one of the ten most-cited computational scientists in the world.

Panel Moderators

Calestous Juma is Professor of the Practice of International Development and Director of the Science, Technology, and Globalization Project. He directs the Agricultural Innovation in Africa Project funded by the Bill and Melinda Gates Foundation and serves as Faculty Chair of Innovation for Economic Development executive program. Juma is a former Executive Secretary of the UN Convention on Biological Diversity and Founding Director of the African Centre for Technology Studies in Nairobi. He is co-chair of the African Union's High-Level Panel on Science, Technology and Innovation and a jury member of the Queen Elizabeth Prize for Engineering. He has won several international awards for his work on sustainable development.

Peter Bol is the Charles H. Carswell Professor of East Asian Languages and Civilizations. He led Harvard's university-wide effort to establish support for geospatial analysis in teaching and research; in 2005 he was named the director of the CGA. He directs the China Historical GIS project, a collaboration between Harvard and Fudan University in Shanghai to create a GIS for 2000 years of Chinese history, and is involved in other projects

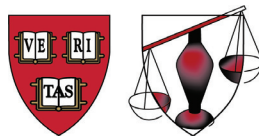
aimed at enhancing digital information linkages between East Asian and Western scholars.

Kevin Pomfret is the Executive Director of the Centre for Spatial Law and Policy and a lawyer focusing on the unique legal and policy issues associated with spatial data and spatial technology such as intellectual property rights, licensing, liability, privacy and national security. He is a member of the Board of Directors of the Open Geospatial Consortium and is active in other geospatial associations. Prior to attending law school, Kevin served as a satellite imagery analyst and a Soviet analyst for the U.S. government where he helped to develop imagery collection strategies to monitor arms control agreements. He also served as the special assistant to the U.S. government official responsible for developing the intelligence community's satellite imagery collection and exploitation requirements.

Zachary Tumin is Special Assistant to the Director of the Belfer Center, and Faculty Chair, Science, Technology, and Public Policy Program. He leads the Belfer Center's project in Information and Communications Technology and directs the Harvard component of a joint Harvard-MIT initiative in cyber security. His research focuses on the strategic management of collaboration across the boundaries of organizations, sectors, and citizens where information and communications technologies are critical enablers or obstacles. Of special interest are issues of people and politics; platforms, policy, and performance in matters of defense and intelligence; civic and political engagement; education, public health and public safety; and related areas.

Stephen Ervin is Assistant Dean for Information Technology at Harvard Design School, Director of Computer Resources, and lecturer in the Department of Landscape Architecture, at the Harvard Graduate School of Design. His MLA is from UMass/Amherst, his PhD from MIT, and he is a Fellow of the American Society of Landscape Architects (FASLA). His current interests include Geodesign, innovation in digitally enabled design teaching and learning, and algorithmic design.

Urs Gasser is the Executive Director of the Berkman Center for Internet & Society at Harvard University. He teaches at Harvard Law School and Fudan University School of Management (China). Urs serves as a trustee on the board of the NEXA Center for Internet & Society at the University of Torino and on the board of the Research Center for Information Law at the University of St. Gallen, and is a member of the International Advisory Board of the Alexander von Humboldt Institute for Internet and Society in Berlin. □



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