

NEW GEOGRAPHIES

NEW GEOGRAPHIES 07

GEOGRAPHIES OF INFORMATION

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**GEOGRAPHIES OF
INFORMATION**

edited by ALI FARD & TARANEH MESHKANI

New Geographies 07

Geographies of Information

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Geographies of Information

Ali Fard &
Taraneh Meshkani

Digital information and data flows permeate every aspect of our society. Global networks of communication form the backbone of commerce, education, and entertainment. The ubiquity of mobile devices, RFID tags, Wi-Fi hotspots, and online platforms has shifted our understanding of the fundamental qualities of physical space—distance, time, presence—and extended our digital footprint beyond the common spaces of home and office. The speed at which bits of information travel has enabled an almost-real-time engagement with massive amounts of information and facilitated new forms of communication, transforming the traditional broadcasting culture of previous technologies into many-to-many and interactive forms of communication.

Within this context, design extensively avails itself of the technological bounty of advanced digital tools such as CAD and CAM. Yet beyond the tools, the fluidity of digital information and the seemingly immaterial nature of communication dominate most discussions. Looking past the immaterial and fluid characteristics of global networks of information and communication to ground these networks spatially has proven to be a challenge. This has been partly due to the increasing complexity of the imbrications of digital networks and physical environments, which have for the most part escaped the attention of purist analyses of either space or technology. The enmeshing of physical environments and digital data networks of monitoring, surveillance, and control brings with it a dramatic rescaling and a destabilization of older hierarchies of scale. Furthermore, the links between urban space and cyberspace have

created a myriad of sociocultural practices and political processes that have reoriented our understanding of both physical and virtual spaces. How do information and communication technologies (ICTs) materialize at local, regional, or global scales? How does one define a contemporary geography of information? Will this geography be limited to the reach of Wi-Fi networks that percolate through cafes, offices, and public spaces of our cities, or can it also be read in the physical imprints of communication that extend far beyond the urban nucleus of cities, blanketing the globe in thick layers of wires and electronic signals? What new spatial conceptions emerge as the rapid deployment of ICTs challenges our perception of the spaces and places traditionally associated with the dissemination of information and public social interactions? Further contributing to the difficulty of grounding information and communications networks is the revolutionary ideology embedded in ICTs, which has tended to ignore the evolution of these technologies and their social and political relationships over the span of at least the past century. How does one contextualize the ever-expanding histories, forms, processes, and practices influencing the multiple geographies of information?

Understanding the contemporary networks of information and communication as inherently geographic, *Geographies of Information* attempts to realign design's relationship to ICTs by expounding the multiscalar complexities and contextual intricacies underlying their various footprints.⁰¹

For designers and urbanists, the friction between the fluidity of information flows and their materialization at

various scales and within diverse geographies has roots in historical discussions stemming back to the military projects of World War II.⁰² With the rise of cybernetics and the study of control systems in the years following the war, the influence of electronic communication technologies and their networks began to permeate the spatial disciplines as major conceptual drivers.⁰³ Under the heavy influence of the theoretical discourse of Marshall McLuhan and Buckminster Fuller, from the 1950s on, architecture embraced electronic communication and computers and eagerly anticipated their potential effect on cities and urban environments.⁰⁴

Fascinated with the processing power of computers and the connective fabric of communication networks, architectural practices of the 1960s began to imagine the city as a giant computer or communication system. Cedric Price and Archigram in the United Kingdom, Superstudio and Archizoom in Italy, and the Metabolists in Japan emerged among the radical voices who believed that the new wave of electronically mediated ICTs would bring about a dramatic shift in the concept of the urban. Freed from the fixity and materiality of traditional urbanism, the city was now able to move, expand, and disperse.⁰⁵ Although the shift toward urban software gained great traction within the architectural discourse of the time, it was precisely software's dialectical relationship to the hardware that underlined almost every radical project of the 1960s.

During the next three decades, the influence of these ideas on architecture and other spatial fields was such that notions of urban transcendence—in which electronic technologies of communication would somehow replace or surmount the physicality of cities—permeated much of the discussion around ICTs and space.⁰⁶ Within this discussion, a lack of critical perspective on ICT-mediated shifts away from urban form and places often encouraged a concomitant belief that more democratic, egalitarian, decentralized, and ecologically sensitive societies would necessarily emerge as a result.⁰⁷ Having evolved from the spatial ideologies of cities and technology from the 1960s, these theories implied, in some way or another, an end to the city as we knew it.⁰⁸ More recent studies have shown, however, that although some urban exchange has been replaced by digital communication, processes of metropolitanization have granted a renewed importance to highly concentrated cities such as New York and London as command and control nodes within the global networks of production, consumption, and logistics.⁰⁹ Not only have cities not disappeared but, in fact, they have grown; and the resulting urban spaces are highly fragmented and of unequal infrastructural development and accessibility.¹⁰

While the incorporation of ICTs within every aspect of modern society has introduced new dynamism and hypermobility to capital, space, and social interaction, the fluidity of global networks of communication is continually materialized in the very physical infrastructure of connectivity. For influential scholars of spatial political economy, this spatial fixity lies at the core of capitalism's thirst for geographic and territorial expansion.¹¹ The investment into pipes, wires, cables, roads, ports, airports, and railways that underlie and connect moments of agglomeration grounds these infrastructural networks in the very space and time they are trying to overcome. Their fixity essentially embeds these networks in the social, political, and environmental processes of the localities in which they are placed.

Such material embeddedness generates urban metabolic linkages between ICTs and the “grounded” infrastructures (water, electricity, transportation) that form the basis of their local spatial production. In the case of data centers, the quintessential building typology of the information age, access to inexpensive sources of energy is required to feed the power-hungry servers and equipment.¹² The availability of immediate sources of water is also essential, as the equipment needs to be kept cool. The installation, expansion, and servicing of data centers require reliable access to transportation infrastructure. Local tax incentives and inexpensive land prices round out some of the basic prerequisites of tech company investment in a community. Physical geography, local politics, infrastructural accessibility, and location in relation to major markets of information consumption and production each play an essential role in where and when networks of information and communication hit ground. The process is inherently geographic, essentially linking ICT networks to the larger environmental systems and sociopolitical relationships that govern processes of energy generation, land use planning, water management, and capital production.

These underlying sociopolitical relations, however, are often concealed by the buried conduits of global communication and the invisible electronic signals of information—in other words, by the physical absence of ICTs in our everyday lives. Relegated to the underground and the atmosphere, tucked in the sleepy corners of the developed world, and secured behind concrete and defensive urban design, the “hidden form” of information has to a large extent escaped the critical gaze of scholars and designers alike. As Maria Kaika and Erik Swyngedouw suggest, urban infrastructure's move out of sight during the twentieth century greatly contributed to an occult reading of the social relations and power mechanisms

coded in and manifested through these urban networks and the flows that run through their pipes, cables, conduits, and electronic signals.¹³ This tendency of urban infrastructural networks to remain out of sight is only interrupted by accidents, disasters, or systematic failures, which bring them back into the scope of our spatial consciousness. Disruptions not only make the hidden form of infrastructural networks visible, they also contribute to the continual regeneration of these networks and expose how they regulate the livelihoods of those dependent upon them.¹⁴ The bursting of the dot-com bubble, the many cables cuts in the middle of oceans, damage from satellite debris, loss of signal messages, destruction of essential regional and national communication networks from terrorist attacks, winter storms, earthquakes, and floods are all examples of the sudden rematerialization of the global networks of information brought about by disruption.

With cities constantly at risk—of terrorist attacks, natural disasters, the spread of disease, infrastructural failure, public upheaval—the paradigms of urban security and resilience have greatly shifted the focus of urban management and planning. Expanding on Ulrich Beck's arguments in his book *Risk Society*, urban health is now judged by how well a city responds to risk.¹⁵ Furthermore, demographic change (often caused by migration or the aging of a population), the densification and overpopulation of city centers, problems related to sprawl, the overconsumption of energy, environmental hazards, sustainability concerns, and the exacerbation of inequality are now among the growing concerns of cities and urban environments. Within this context, large technology corporations have emerged as the flag-bearers of urban risk mitigation. Paralleling the enthusiastic response of planners to techno-scientific management of urban environments through advanced military technology after World War II, cities have for the most part embraced the promise of high technology to respond to risk and alleviate the myriad of urban problems they face.¹⁶ From established cities such as Rio de Janeiro to new developments such as Songdo, in South Korea, new urban technology is employed to do it all—from alleviating traffic jams to responding to a crime.

Tech companies such as IBM, Cisco, Siemens, and Google have identified cities as an emerging market and have invested heavily in developing urban technology, contributing to the construction of an ideology of digitally mediated urban intelligence often referred to as the "smart city." While these corporate players partner with governments to monitor and manage urban infrastructure and services, they have for the most part adopted a

neoliberal ideology, believing that the market can better manage and more efficiently deal with urban problems than can governments. Public intellectuals and others have responded, however, by decrying the depoliticization of cities and the privatization of urban infrastructures.¹⁷ Smart city projects tend to be utopian in nature and deal with urban problems in a techno-scientific manner. The premise of most of these corporate plans is based solely on smart technologies and data optimization, and they often neglect the role of spatial form or citizen agency in finding urban solutions.¹⁸

It is important to note that whereas smart city ideologies have met with increasing criticism, not all urban technologies are viewed negatively. As opposed (and perhaps in response) to the top-down approach of IT corporations, many bottom-up open-source platforms have emerged (like SeeClickFix) that enable citizens to find solutions to their local infrastructure problems. Wide adoption of digital technology has also broadened accessibility and participation, contributing to the empowerment of individuals and improving transparency and accountability within traditional power structures. Successful new social movements and civic protests—the Arab Spring, Iran's Green Movement, the Euromaidan protests of Ukraine, the Occupy Movement, the 2014 Hong Kong protests—coordinated in part by digital "liberation technologies" and social media, provide positive examples of sociopolitical transformation through the use of ICTs.¹⁹ Posts on social media networks like Twitter and Facebook, uploaded videos of protests by citizen journalists on YouTube, messaging on mobile technologies, and broadcasts by news networks from the main sites of contestation not only helped mobilize people and resources but also transformed the nature of public urban spaces during the recent uprisings. The Habermasian notion of the public sphere as a constellation of communicative and deliberative spaces that link citizens to states has become increasingly relevant in these protests, even though postmodern critiques of the public sphere still remain valid.²⁰ In addition to the physical spaces of interaction (coffeehouses and salons), the means of communication and information circulation (newspapers, books, pamphlets) have proven critical to the notion of the public sphere. In this regard social media platforms can be considered as not only the extension of the public spaces of streets, squares, parks, or libraries but also a new spatial condition facilitating interaction and communication.

Like physical space, however, digital media platforms are influenced by rules and regulations of access, control, use, and private versus public ownership. And although

many believe that access to information and new communication technologies has empowered citizens and helped resolve a myriad of social justice issues, others are mistrustful of the way ICTs can be used as instruments of surveillance to monitor our daily lives.²¹ These technologies are frequently used as means of control, secrecy, surveillance, and censorship at many levels of governance and society. This realization has precipitated a shift away from theories of surveillance and control through bureaucratic institutions or panoptic supervision and policing, toward theories involving real-time methods of surveillance that require neither the spatial rigidity of subjects nor their direct observation.²² New digital surveillance technologies are, in many instances, different from traditional surveillance techniques in the way they deal with space. These technologies track bodies, vehicles, objects, and events in real time. They automate data collection and monitor space at vast geographic scales. Yet, as Stephen Graham and David Wood suggest, the conditions created by digital surveillance technologies have been affected by the processes of liberalization and privatization of public space.²³ The proliferation of closed-circuit television (CCTV) cameras exemplifies this condition: deployed as technical aids to detecting and preventing crime, vandalism, and even terrorism throughout the public and private realms, CCTVs have raised concerns regarding the end of privacy and the functioning of public space as an arena for social and political interaction and deliberation.

Furthermore, the new means of analyzing, modeling, and mapping urban data through data-mining algorithms or models for predictive analysis have given rise to “dataveillance.” The data collection enabled by new geo-located technologies (GPS, mobile phones, social networks, crowdsourcing applications, remote sensing by satellites or drones, airborne RFID tags, credit cards) creates new urban knowledge and supports dynamic new urban models—models vastly different from the conventional, structured, census-based ones of the past. Even though these new dynamic processes of data analysis grant us more control over the performance of urban systems and of the ways in which we challenge the social and economic problems of cities, they also increasingly influence the politics of data and the violation of privacy rights. The National Security Agency’s recent surveillance activities involving email communication metadata and phone tapping underscore the downside of centralized “big data” collection and analysis.

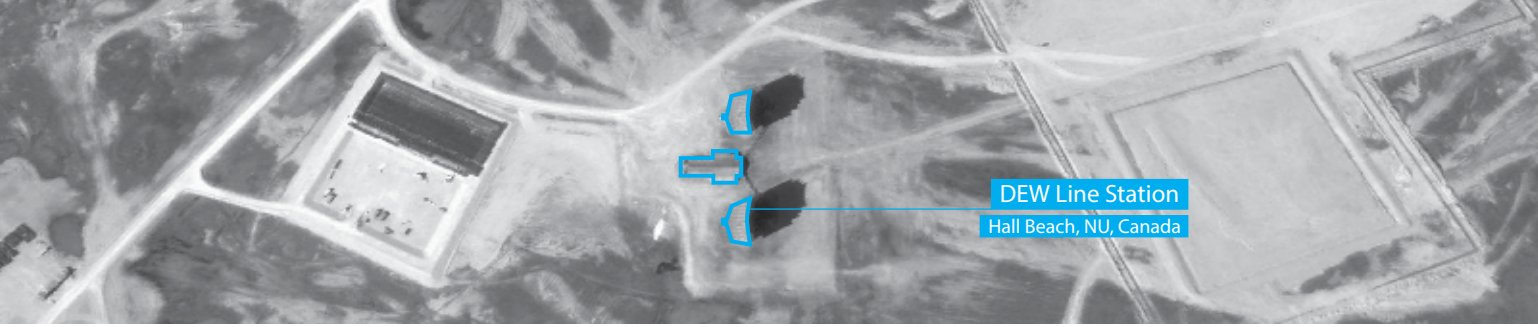
The most prevalent readings of ICT networks are plagued by conceptual dualities. By focusing on various binary conditions related to the materiality (physical

or virtual), manifestation (hardware or software systems), scales of operation (global or local), or relational characteristics (social or technological) of ICTs, these analyses have been unable to fully articulate the spatial complexities of these technologies. Contemporary ICTs are inherently hybrid constructions that challenge the rigid distinctions and dichotomies between society and technological networks, macro and micro scales, human and nonhuman actors. Most importantly, the emphasis on virtuality, to the exclusion of the physical realm, often leads to a downplaying of the material conditions and physical spatialities inherent to the hypermobility of ICTs. The construction of cyberspace is dependent upon the nondigital, from its various material conditions, capital fixities, and infrastructural requirements to more symbolic means of understanding these spatialities. Hence, a hybrid reading of ICTs and their spatial constructions will better ground them within the social, cultural, technological, and political processes of the contemporary societal condition.

Geographies of Information suggests emphasizing the impure, messy, and dynamic characteristics of our contemporary society as a more productive way of studying the hybridities that support the construction of the networked materialities and social-technical relationships of information and communication networks. This volume thus presents a new set of frameworks that refrain from generalizations prevalent in modern scientific thought to highlight the complexity of socio-technical constructions, processes, and practices that form the spaces of information and communication.

A number of contributions in this volume investigate the historical origins of early communication networks and analyze the significance of geographic context and spatial form in their generation [Papanikolaou / Varnelis]. Other historical contributions explore the military and state origins of networked urban technologies of information and communication and the processes and practices that emerge from these initiatives as critical moments within the ICTs’ development [Light / Kotsioris]. Following this historical contextualization, other contributions highlight the recent rise of big data and predictive analytics. They offer critical perspective on how these technologies have transformed our perception of urban intelligence, and their influence on how urban environments are imagined, monitored, and organized [Kitchin / Shepard]. Whereas some contributors look into questions of infrastructural sustainability and the productive convergence of information technologies with other infrastructural

Opposite: Grounded geographies of information.



DEW Line Station
Hall Beach, NU, Canada



Facebook Data Centers
Prineville, OR



60 Hudson Ave. (Western Union Building)
Manhattan, NY



Tahrir Square
Cairo, Egypt



NSA Utah Data Center
Bluffdale, Utah



Songdo International Business District
Songdo, South Korea

networks [Orfanos, Marinou, Sagia & Pollalis], others critique various smart city notions, including the privatization of services and infrastructures by corporate players, inequality of access and cost, the creation of generic spaces, and the emergence of new modes of surveillance and control [Picon / Greenfield / Steenson / Kitchin].

Other essays aim to underline the linkage of new ICTs and their spatialities to the social, cultural, and political processes of contemporary societies. Authors investigate fundamental conceptions of the embeddedness of information in localities, bottom-up versus top-down management of urban spaces, computational scarcity, inequality of access to information, and the emergence of new models of geographic distribution of information [McCullough / Blanchette / M. Graham / Bratton]. The influence of ICTs on the public sphere and on the political process, facilitated by social media and encouraged by new forms of activism, emerge as important aspects of these investigations [Lim / Blanchfield].

Attempting to ground these processes and practices, another group of contributions looks into the imprints and physical footprints of information technologies. These

contributions examine the incipient geographies of ICTs, their building typologies and relationships to site conditions, operational scale, energy needs, and environmental requirements [S. Graham / Hallak / White]. In parallel with these investigations of ICTs' spatial manifestations, other essays and projects examine historical and emerging methods of computational mapping, along with platforms and technologies for data-driven spatial modeling and data visualization [Wilson / Pirokka, Ellis & Del Tredici].

Geographies of Information is framed as a response to the immaterial, frictionless, acontextual, and nonspatial ideologies that continue to surround contemporary networks of information and communication. Hence, this volume examines the forms, imprints, places, and territories in which the dynamism and fluidity of contemporary networks of information become crystallized. It brings together a collection of works by scholars, designers, artists, and journalists to form a spatially grounded and nuanced account of the hybrid conditions that ICTs generate, the scales at which they operate, and the processes and practices by which this production of space manifests in both advanced and emerging economies.

01. The geographic approach to design and urbanism has been at the core of the *New Geographies* project since its inception at the Harvard University Graduate School of Design by Hashim Sarkis and a group of Doctor of Design candidates. This volume is the second in a three-part series investigating the formal, spatial, and material imprints of contemporary processes of urbanization.
02. Jennifer S. Light, *From Warfare to Welfare: Defense Intellectuals and Urban Problems in Cold War America* (Baltimore: Johns Hopkins University Press, 2003).
03. The study of patterns in nature and human organizations initiated by cybernetics gained greater prominence in the architectural discourse of the time, prompting a disciplinary concern for the invisible connective networks of communication. See Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge, MA: MIT Press, 2003).
04. For an engaging account of network thinking and its adoption in architecture, see Mark Wigley, "Network Fever," *Grey Room* 4 (Summer 2001): 83–122.
05. See Melvin M. Webber, "Order in Diversity: Community without Propinquity," in *Cities and Space: The Future Use of Urban Land*, ed. Lowdon Wingo (Baltimore: Johns Hopkins University Press, 1963), 23; and Mark Wigley, "Resisting the City," in *Transurbanism*, ed. Arjen Mulder (Rotterdam: V2_Publishing/NAi Publishing, 2002), 103–21.
06. See Mark Wigley, "Resisting the City"; and Stephen Graham, *The Cybercities Reader* (London: Routledge, 2004).
07. Graham, *Cybercities Reader*, 8.
08. William Mitchell, for example, hypothesized that advances in digital communications networks and information technologies would eventually replace much of the physical circulation in cities. Advancing the longstanding concept of digital tools as extensions of the human body, Mitchell believed that many of the urban exchanges would eventually be rendered redundant by digital ICTs. William J. Mitchell, *City of Bits: Space, Place, and the Infobahn* (Cambridge, MA: MIT Press, 1995).
09. See Manuel Castells, *The Informational City: Information Technology, Economic Restructuring and the Urban-Regional Process* (Oxford: Blackwell, 1989); and Saskia Sassen, *The Global City* (Princeton, NJ: Princeton University Press, 1991).
10. Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001).
11. As David Harvey has suggested, global capitalism has a tendency—in fact, a need—to transcend the constraints of space and time through spatial fixity. See David Harvey, "Globalization and the 'Spatial Fix,'" *Geographische Revue* 3, no. 2 (2001): 23–30.
12. A recently published report by Greenpeace estimates that a single data center can consume the equivalent amount of electricity as nearly 180,000 homes. Based on current projections, the demand for electricity for the global IT sector is set to increase to an amount greater than the total combined electricity demands of France, Germany, Canada, and Brazil. See Gary Cook, "How Clean is Your Cloud?," Greenpeace, April 2012, <http://www.greenpeace.org/international/Global/international/publications/climate/2012/iCoal/HowCleanisYourCloud.pdf>.
13. Erik Swyngedouw and Maria Kaika, "Fetishizing the Modern City: The Phantasmagoria of Urban Technological Networks," *International Journal of Urban and Regional Research* 24, no. 1 (March 2000): 120–38.
14. See Stephen Graham, ed., *Disrupted Cities: When Infrastructure Fails* (New York: Routledge, 2010).
15. Ulrich Beck, *Risk Society: Towards a New Modernity*, trans. Mark Ritter (London: Sage Publications, 1992).
16. Light, *From Warfare to Welfare*.
17. See, for example, Rob Kitchin, "The Real-Time City? Big Data and Smart Urbanism," *GeoJournal* 79 (2014): 1–14; Adam Greenfield, *Against the Smart City* (New York: Do projects, 2013); and Richard Sennett, "No One Likes a City That's Too Smart," *Guardian*, December 4, 2012.
18. Alberto Vanolo, "Smartmentality: The Smart City as Disciplinary Strategy," *Urban Studies* 51, no. 5 (2014): 883–98.
19. Larry Diamond and Marc F. Plattner, eds., *Liberation Technology: Social Media and the Struggle for Democracy* (Baltimore: Johns Hopkins University Press, 2012); and Manuel Castells, *Networks of Outrage and Hope: Social Movements in the Internet Age* (Cambridge, UK: Polity Press, 2012).
20. See Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, trans. Thomas Burger, with Frederick Lawrence (Cambridge, MA: MIT Press, 1991).
21. Evgeny Morozov, *The Net Delusion: The Dark Side of Internet Freedom* (New York: Public Affairs, 2011).
22. See, for example, Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (New York: Vintage Books, 1995); Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (Winter 1992): 3–7; David Lyon, *Surveillance Society: Monitoring Everyday Life* (Buckingham, UK: Open University, 2001); and Oscar H. Gandy Jr., *The Panoptic Sort: A Political Economy of Personal Information* (Boulder, CO: Westview Press, 1993).
23. Stephen Graham and David Wood, "Digitizing Surveillance: Categorization, Space, Inequality," *Critical Social Policy* 23, no. 2 (May 2003): 227–48, esp. 229.

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Caitlin Blanchfield is a writer, researcher, and editor who lives in New York City. Her work focuses on issues of infrastructure, territory, and political economy. She has a master of science in critical, curatorial, and conceptual practices in architecture from Columbia University, and is an editor in the Office of Publications at Columbia's Graduate School of Architecture, Planning and Preservation as well as of the *Avery Review*. Her writing appears in *San Rocco*, *Apogee*, *Artforum*, and elsewhere.

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Ali Fard is a designer and a researcher. He is currently a lecturer at the University of Waterloo, a doctoral candidate at Harvard University Graduate School of Design, and an editor of the *New Geographies* journal. Ali is the cofounder of Op.N, a design and research office based in Toronto and Boston, and a research associate at the Urban Theory Lab at Harvard GSD. His current research deals with the operational landscapes of connectivity and the urban/spatial disposition of information and communication technologies. Ali's research and design work have appeared in *MONU*, *MAS Context*, *Bracket*, *Azure*, and *Harvard Design Magazine*. He holds a master of architecture from the University of Toronto.

Mark Graham is associate professor at the Oxford Internet Institute, University of Oxford. His research focuses on information geographies, and the differences that changing digital connectivities make at the world's economic margins. His current work looks at changing "knowledge economies" in sub-Saharan Africa, focusing on geographies of information production, virtual labor and microwork, and innovation hubs and the digital economy in fifteen African cities. Mark's recent books include *Society and the Internet: How Networks of Information and Communication Are Changing Our Lives* (with Bill Dutton; Oxford University Press, 2014) and *Research and Fieldwork in Development* (with Dan Hammett and Chasca Twyman; Routledge, 2014). His research has been featured in the *Economist*, the BBC, the *Washington Post*, CNN, the *Guardian*, and other international media. He is an editor or editorial board member of *Information, Communication, and Society*, *Geo, Environment and Planning A*, and *Big Data & Society*, and a member of the Department for International Development's Digital Advisory Panel.

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Shuli Hallak is an award-winning professional photographer with ten years of experience documenting core infrastructure. In 2013, she founded Invisible Networks with the mission of making the Internet visible. Currently, she is developing web-based, data-driven interactive visuals. Her work has been published extensively in *Fortune*, *Fast Company*, the *Wall Street Journal*, the *New York Times Magazine*, *Bloomberg News*, *Slate*, *Orion*, and elsewhere. Shuli

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Peter Del Tredici is associate professor in practice at the Harvard Graduate School of Design, where he has been teaching in the Landscape Architecture Department since 1992. He recently retired from the Arnold Arboretum of Harvard University, where he worked for thirty-five years as director of living collections and senior research scientist. His interests are wide-ranging and include such subjects as the root systems of woody plants, the ecology of hemlocks, and the natural and cultural history of the ginkgo tree. His recent work is focused on urban ecology and was published in the widely acclaimed *Wild Urban Plants of the Northeast: A Field Guide* (Cornell University Press, 2010) as well as a GPS-based mobile app, *Other Order*, which interprets the Bussey Brook Meadow section of the Arnold Arboretum (with Teri Rueb).

Erle Ellis directs the Laboratory for Anthropogenic Landscape Ecology (ecotope.org), is professor of geography and environmental systems at the University of Maryland, Baltimore County, and is visiting professor of landscape architecture at Harvard Graduate School of Design. His research investigates the ecology of human landscapes at local to global scales with the aim of informing sustainable stewardship of the biosphere in the Anthropocene. Recent projects include the global mapping of human ecology and its changes over the long term (anthromes), online tools for global synthesis of local knowledge (GLOBE), and inexpensive user-deployed tools for mapping landscapes in 3-D (Ecosynth).

Michalis Pirokka is a licensed architect in Europe and has a master of landscape architecture from Harvard Graduate School of Design and a bachelor of architecture from the University of Patras in Greece. During his studies, he received awards in a number of international competitions and was the recipient of the Penny White Project Fund at the GSD, a fund that is awarded annually to students in landscape architecture and allied design disciplines that promote creative research. He was a research assistant at the "Structures of Coastal Resilience" project, a design research project coordinated by a Princeton University team led by Guy Nordenson and Michael Oppenheimer. He is currently a landscape designer at MVVA.

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Spiro N. Pollalis is professor of design, technology and management at Harvard Graduate School of Design. He is director of the Zofnass Program for Sustainable Infrastructure, which has led to the Envision Rating System. He is the principal investigator of the project Gulf Sustainable Urbanism for ten cities in the Persian Gulf, sponsored by the Qatar Foundation. He has taught as visiting professor at the ETH Zurich, Switzerland; Delft University of Technology, Holland; University of Stuttgart, Germany; and University of Patras, Greece. He serves as the cochair of the Advisory Committee on Future Cities for the Singapore ETH-Zurich Center. Pollalis is the chief planner for the new DHA City Karachi for 600,000 people,

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Yannis Orfanos's work focuses on enhancing the sustainability of cities with information technology. It concerns the development of data-driven tools to better understand how urban environments work and address the existing or emerging challenges. He has a diploma in architectural engineering and master of philosophy in architecture from the National Technical University of Athens, and master of architecture in architecture and urbanism from the Design Research Lab at the Architectural Association. Yannis has professional experience as an architect and planner in Athens, London, and Barcelona. He is currently research associate at Harvard Graduate School of Design, where he is investigating sustainable infrastructure systems at the Zofnass Program for Sustainable Infrastructure and healthier cities at the Health and Places Initiative.

NEW GEOGRAPHIES

New Geographies 07: Geographies of Information is the second in a series of three volumes that question the dimensions and materialities associated with the geographical registration of the complex and multiscalar social, technical, and environmental processes that constitute contemporary urbanization. In volumes 0 to 5, the primary aim of the journal was to foreground the emergence of the geographic as a paradigm that would allow design to provide a broader, more engaged, and more dialectical response to context. This investigation revealed that as designers are increasingly compelled to shape larger scales and address complex urban and ecological issues, they depend increasingly on social, economic, and ecological interpretations of space. While these interpretations typically embrace the dynamism of processes, flows, and networks, they seem to have overlooked their material imprints on geographic space. This series addresses the apparent disjunction between verifiable as well as speculative relations among processes, flows, and networks (which has dominated contemporary debates on urbanization) and their geographical imprints, whether designed or simply inherited in the physical organization of territories.

New Geographies 06: Grounding Metabolism

Over the past decade, there have been widespread efforts to reposition design and its agency in relation to a changing, more fluid, and expanding context. Yet the redefinition of the context itself has proven to be a serious challenge—not only due to the increasing complexity of urban environments, but because their socio-environmental intensities and interdependencies are now expanding across the earth. As a metaphor derived from the physical sciences, the notion of urban metabolism offers a framework for understanding the production of space as well as its circulatory and functional dynamics. Bringing together contributions within and outside the design disciplines, *New Geographies 06: Grounding Metabolism* aims to trace alternative routes to design through a more elaborate understanding of the relation between concepts of urban metabolism and the formal and material engraving of metabolic processes across scales. This volume addresses the challenges associated with the planetary dimension of contemporary metabolic processes, it offers a critical examination of the long lineage of historical discussions and schemes on urban metabolism from the design disciplines, and it places them in parallel with a set of contemporary projects and interventions that open up new approaches for design.

New Geographies 08: Island

As a master metaphor, the island has been a fecund source of inspiration in multiple domains. From Thomas More's *Utopia* to Darwin's evolutionary theory to Ungers's archipelago, insights derived from "island thinking" are commonly extrapolated across scales and fields. The recurrence and appeal of the island metaphor lie in its capacity to simplify the complex and to frame the seemingly unbounded. Yet the island seems to confront current ontological mainstreams in the geographic and its articulation in the design fields. Globalization's motifs of openness and interconnection and ecology's privileging of environmental processes and flows over forms and objects challenge the pertinence of the island as a cognitive device for territorial description and intervention. *New Geographies 08* proposes an epistemological pulse between the ultimate loss of the exterior implied in the planetary upscaling of territorial interpretations towards an idea of the world as a whole, and the need to rearrange new boundaries in an environment frequently explained through the process-oriented lens of ecology. As an "atlas" of islands, *New Geographies 08* will explore the new limits of islandness, and will gather examples to reassert its relevance for the design disciplines.