

Brief Biography and Summary

Michael Batty is, by training, an architect-planner and geographer. He is Bartlett Professor of Planning at University College London where he is Chairman of the Centre for Advanced Spatial Analysis (CASA). His career began in the University of Manchester in 1966 where he was appointed an Assistant Lecturer in Town and Country Planning. He then spent 10 years at the University of Reading as Research Assistant, Lecturer and Reader in Geography, before moving to the University of Wales Institute of Science and Technology (now the University of Cardiff), in 1979, where he was Professor of Town Planning. During this time, he acted as Head of Department, and Dean of the Faculty of Environmental Design. In 1990, he moved to direct the NSF National Centre for Geographic Information and Analysis (NCGIA) at the State University of New York at Buffalo (SUNY-Buffalo) where he was a Professor of Geography. He has held several visiting appointments in computing, engineering, planning, and geography at the Universities of Illinois, Melbourne, Hong Kong, Bristol, and Michigan, and is currently a Visiting Distinguished Professor at Arizona State University, and an Honorary Professor at Cardiff University.

He has been at UCL since 1995 where he set up CASA as an interdisciplinary centre focussed on the development of mathematical models and digital technologies in geographical information science, urban and regional modelling, and the science of cities. CASA has grown to around 50 research and administrative staff in the last 15 years and now has an annual income of around £3 million mainly funded from research grants coming primarily from EPSRC, ESRC, JISC, the EU 7th Framework, and the ERC.

He was a member of the Computer Board for British Universities and Research Councils (1988-1990), and Chair (1980-1982), then Vice-Chair (1982-1984) of the ESRC (Economic and Social Research Council) Environment and Planning Committee. He was a member of the SERC (Science and Engineering Research Council) Transport Committee (1982-1985). He is currently Chair of the ESRC Census Advisory Committee and was a Member of the Advisory Panel on Public Sector Information which is part of the Ministry of Justice (2003-2010). From 1997 to 2003, he was a member of the Association of Universities of the Netherlands (VSNU-NWO-KNAW) Quality Assessment of Research (RAE) Panel for the Built Environment acting as Chair at TU-Delft in 2003. He was a member of the RAE 2006-2009 Geography Panel.

His research work involves the development of computer models of cities and regions, and he has published many books and articles in this area, the most recent being **Cities and Complexity** (MIT Press, Cambridge, MA, 2007) for which he was awarded the Alonso Prize of the Regional Science Association in 2011, and his recent edited book is **Agent-Based Models of Geographical Systems** (Springer, Berlin, 2012). His book **The New Science of Cities** will be published in November 2013 by MIT Press. He is editor of the journal **Environment and Planning B: Planning and Design**. His work can be seen at <http://www.complexcity.info/> and at <http://www.casa.ucl.ac.uk/>. He has received various honours for his work. In 1999, he was awarded the Sir George Back Award by the Royal Geographical Society for 'contributions to national policy and practice in planning and city design', the Association of Geographic Information Award for Technological Progress (1998) and for Innovation (2002). He was elected as a Fellow of the Royal Society of Arts in 1982, made a Fellow of the British Academy in 2001, elected to the Academy of Social Sciences in 2001, and awarded a CBE in the Queen's Birthday Honours in June 2004 for 'services to geography'. He was elected a Fellow of the Royal Society in 2009, and is the recipient of the 2013 Lauréat Prix International de Géographie Vautrin Lud (the so-called Nobel for geography)

My full CV follows: Part 1 deals with personal/professional information, university appointments, external appointments, teaching and examining, research, and with professional practice. Part 2 list all publications. American English is used where necessary and appropriate.

*Full Curriculum Vitae: Part 1: Career Details**Personal Information*

Full Name	(John) <u>Michael</u> Batty
Current Appointment	Bartlett Professor of Planning, Chair, Centre for Advanced Spatial Analysis (CASA), University College London (UCL)
University Address	90 Tottenham Court Road, London W1T 4TJ, UK Tel +44 (0) 20 3108 3877 Fax +44 (0) 20 3108 3258 Email m.batty@ucl.ac.uk Web http://www.ComplexCity.info/
Citizenship	British

Degrees and Professional Qualifications

BA	University of Manchester, First Class Honours 1962-1966
PhD	University of Wales, Institute of Science and Technology, 1984
FRTPI	Fellow of the Royal Town Planning Institute, 1983, Member 1971
FCILT	Fellow of the Chartered Institute of Logistics and Transport, 1990, Member 1984

Elections to Learned Societies

FRSA	Fellow of the Royal Society of Arts, elected 1982
FBA	Fellow of the British Academy, elected 2001
AcSS	Academician of the Social Sciences, elected 2001
FRS	Fellow of the Royal Society, elected 2009

Honours and Awards

1966	<i>Clifford Holliday Prize</i> for highest honours (First Class) Town and Country Planning, University of Manchester
1992	<i>Wesley Dougill Prize</i> for the paper "New Technology and Planning: Reflections on Rapid Change and the Culture of Planning in the Post-Industrial Age, <i>Town Planning Review</i> , 62, 269-294, 1991
1998	<i>AGI Award for Technological Progress</i> : Association of Geographic Information awarded to the Centre for Advanced Spatial Analysis
1999	The Royal Geographical Society's <i>Back Award</i> for the Reward and Encouragement of Scientific Geography in "Contributions to National Policy and Practice in Planning and City Design"
2001	<i>Sir Edward Youde Visiting Professorship and Memorial Lecturer</i> , University of Hong Kong, June 2001
2002	<i>AGI Award for Innovation</i> : Association of Geographic Information, awarded to the Centre for Advanced Spatial Analysis
2004	<i>CBE: Commander of the British Empire</i> , Queen's Birthday Honours List June 2004
2006	<i>Clarkson Chair</i> : School of Architecture and Planning: SUNY-Buffalo
2006	<i>Guest Professor</i> School of Urban Design: Wuhan University (PRC) 2006-9
2008	<i>Honorary LH.D.</i> (Doctor of Humane Letters): State University New York
2010	The <i>Alonso Memorial Prize</i> of the Regional Science Association for the book <i>Cities and Complexity</i> (MIT Press, 2005)
2012	The <i>UCGIS Award for Research</i> : University Consortium for Geographic Information Science, 2011-2012,
2013	<i>Lauréat Prix International de Géographie Vautrin Lud</i> (The Nobel for Geography)

Who's Who in the World 1992- Who's Who in America 1993- Who's Who in Science and Engineering 1993- Who's Who 2001- Debrett's People of Today 2002-

University Appointments

1995 to date I joined University College London in 1995 to set up the Centre for Advanced Spatial Analysis (CASA) whose mission is to develop new computer based technologies for a range of spatial problems and policies in the environmental, built form, archaeological, health, and transport areas. I held a joint Chair between the Bartlett School (Architecture and Planning) and the Department of Geography, until being made Bartlett Professor of Planning in 2004. CASA is now within the Faculty of the Built Environment (The Bartlett) at UCL. Currently I am Chair of the Management Board of CASA

Previous Appointments

1990-1995 Director of the National Center for Geographic Information and Analysis (NCGIA), State University of New York at Buffalo, NY, USA
 1979-1989 Professor of City and Regional Planning, Faculty of Engineering and Environmental Design, University of Wales, Cardiff; Dean of the School of Environmental Design 1983-1986; HoD 1985-1989
 1975-1979 Lecturer, then Reader in Geography, University of Reading
 1974-1975 Assistant Professor of Civil Engineering, University of Waterloo, Ontario, Canada
 1969-1974 Research Assistant, then Lecturer in Geography, University of Reading
 1966-1969 Studio Assistant/Assistant Lecturer, Department of Town and Country Planning, University of Manchester

Visiting Appointments

2010 to date Honorary Professor, University of Cardiff
 2010 to date Distinguished Visiting Professor, Arizona State University
 2004 Visiting Scientist, Department of Primary Industries, Government of Victoria, Australia
 2003 Visiting Professor, Eastern Michigan University and University of Michigan, Ann Arbor
 1993-1995 Honorary Professor, Department of Geography, University of Bristol
 1986 Croucher Fellow, Centre for Urban Studies and Urban Planning, University of Hong Kong
 1986 Visiting Professor, National Center for Supercomputing Applications University of Illinois at Urbana-Champaign
 1982 Professorial Fellow, School of Environmental Planning, University of Melbourne
 1972-1974 Tutor in Planning, Polytechnic of Central London

Achievements

CASA and University College London 1995 to date

CASA has attracted substantial funding for research in the application of geographic information, multi-media and virtual reality systems technologies. From 1997 to 2000, it was recipient of a Technology Foresight Challenge Award of £1m to develop a Virtual Reality Centre for the Built Environment. Its research involves computer technologies from the sciences to the humanities and this is reflected in its funding which has been from EPSRC, NERC, ESRC, JISC, the EU and the ERC. The centre has attracted over £13m since it was formally started in 1995-6 and with its links to Geography, has graduated some 45 PhD students. It currently has 12 PhDs, is a node in the ESRC National Centre for Research Methods (NCRM), and is focussed on complexity science as applied to cities and spatial

systems. CASA is part of the Faculty of the Built Environment and is funded through the research streams associated with Planning and Architecture. There is a Director of CASA, the post which I held from its inception to 2010, which has been replaced by a Management Board of which I am Executive Chair.

The NCGIA at SUNY-Buffalo 1990 to 1995

The National Center for Geographic Analysis and Information (NCGIA) is a National Science Foundation research center located on three sites: Santa Barbara, Buffalo and Orono (Maine). I was Director of the Buffalo site and Associate Director of the National Site. The budget of the National Center was around \$3m per annum with a State match of equivalent monies. I was responsible for all aspects of financial management as well as the research program which was based on series of Research Initiatives pursued by various members of the Center through the form of conferences, research projects with graduate student assistantships, and visiting fellowships.

At Buffalo, I was a member of the Faculty of Social Sciences Committee between fall 1992 and summer 1994, an elected member of the University's Faculty Senate, and from 1994 to 1995, a member of the Presidential Review Board for tenure and promotions which deals with all units in the SUNY-Buffalo system. I served on various Faculty Search Committees, on the UB Working Group for Economic Development part of the SUNY 2000 University-wide planning exercise, and the UB Governance Project.

City and Regional Planning at UWIST (University of Cardiff) 1979 to 1989

I was a Professor originally at UWIST (University of Wales Institute of Science and Technology) until it merged with University College Cardiff in 1987 to become the University of Cardiff. From 1985 until 1989, I was Head of the Department of City and Regional Planning (formerly Town Planning), From 1979 until 1985, I held the second Chair in Town Planning with responsibilities for graduate courses and research, and from 1983 to August 1986, I was Dean of the School of Environmental Design.

My greatest achievement during this period was to propel the department into the top accolade in RAE terms. Until 1996 RAE, the department was the only top ranked department in Cardiff. It was graded as 'outstanding' in the first University Grants Committee's (UGC's) ranking published in May 1986. It maintained this distinction in being one of 140 departments in all British Universities designated as of international repute in the 1989 review of departments by the University Funding Council (UFC). It was also graded in the top rank (Grade 5) in 1992, 5* in 1996, and 5* (now 6*) in 2001. In my specialist field of computer modelling, the department was awarded a 'New Blood' lectureship in 1984. In 1986 and in 1988, the department was designated one of the seven ESRC Regional Research Laboratories, and in August 1987, the Welsh Office established a Centre for Housing Management within the department to lead a new initiative in housing education and research. The department was granted a National Academic Appointments Scheme (NAAS) lectureship in 1989.

At Cardiff. I was a member of many committees with my main focus on computing: these were Computer Committee (1980-1984; Chair 1986-1988), Cardiff Joint Computing Committee (1988-1990), SWURCC Technical Advisory Group (1986-1988), SWURCC Policy Committee (1986-1988), Faculty of Engineering and Environmental Design (1988-1990), Senate Policy Committee (1986-1988), Planning and Development Committee (1986-1988), Joint Safety Committee (1986-1988), Departmental Board (1985-1988), Disciplinary Committee (1985-1990), Committee of Deans (1983-1986), University Court (1979-1990), School of Environmental Design (1979-1988), and Senate (1979-1990).

University of Reading 1969-1979

I had normal administrative responsibilities as a lecturer, then reader, in the Department of Geography and School of Planning Studies and was Director of the MSc in Regional and Urban Planning Studies. At various times, I was a member of the Faculty Boards of Urban and Regional Studies, and Letters, a member of the Boards of Studies of the MSc in Regional and

Urban Planning Studies, the MPhil in Environmental Planning, and a member of the Course Committee of the BSc in Scientific Bases of Planning.

The University of Manchester 1966-1969

I was what was called a Studio Assistant with the rank of Assistant Lecturer. I assisted the 4th Year UG Studio Master with projects on design methods and systems planning and also gave a lecture course on planning techniques. I was associated with urban simulation research and retail models.

External Appointments: Research and Related Committees

2006 to 2009	Member, Research Assessment Panel on Geography and the Environment, Higher Education Funding Council
2003 to 2010	Advisory Panel on Public Sector Information, Office of Public Sector Information, Cabinet Office, now the Ministry of Justice
2003 to date	Research Board, Royal Geographical Society
2002 to date	Chair, ESRC-JISC Census Advisory Group
1997-2003	Member of the Association of Universities of the Netherlands (VSNU-NWO-KNAW) Quality Assessment of Research (RAE).
1996-1998	Member, Advisory Group on Computer Graphics, JISC
1995-1999	Member Advisory Board, CIT Initiative in Built Environment University of Cardiff
1992 to date	Member International Advisory Committee National Laboratory Environmental Information Systems, Chinese Academy of Sciences
1989-1990	Member of the Scientific Computing Advisory Panel, Science and Engineering Research Council (SERC)
1988-1990	Member of the Computer Board for Universities and Research Councils
1988-1990	Member of the Natural Environment Research Council (NERC) Committee on Scientific Computing,
1988-1990	Member of the South West Universities Regional Computing Centre (SWURCC) Policy Board
1986-1990	Member, British Computer Society Computer Graphics and Displays Group Executive Committee
1984-1986	Member, RTPI Research Board High Technology Working Party
1982-1985	Member, Joint Transport Committee, Science and Engineering Research Council (SERC) and Economic and Social Research Council (ESRC)
1982-1984	Vice-Chair, Environment and Planning Committee, Economic and Social Research Council (ESRC)
1980-1982	Chair, Planning Committee, Social Science Research Council (SSRC)
1980-1982	Member, Research Board, Social Science Research Council (SSRC)
1980	Member, Planning Committee, Social Science Research Council
1979-1985	Member, Royal Town Planning Institute (RTPI) Research Board,
1977-1978	Member, SSRC Survey Archive/Human Geography Subcommittee

Education Committees

1987-1988	Member of the General Board for Architecture in the University of Cambridge
1986-1990	Visiting Panel, RTPI Education Board
1985-1988	Executive Committee Member, Conference of the Heads of Planning Schools
1984-1989	Member of the University Committee on Integrated Sandwich Courses (UCISC)
1984-1985	Chair, RTPI Course Development Panel Working Party on Information Technology and Planning Education

1980-1984	Member, RTPI Planning Forum
1976-1978	Member, Education for Planning Association Committee

Professional Committees

1986-1990	Member, RTPI South Wales Branch Executive Committee
1979-1981	Chair, British Section, Regional Science Association
1976-1979	Member, International Committee on Computers in Architecture, Building Design and Urban Planning
1975-1979	Member, British Section, Regional Science Association
1974-1978	Member, Urban Policy Planning Committee, Planning, Transport, Research and Computation Ltd. PTRC
1972-1974	Chair, Urban Policy Planning Committee, PTRC

*Teaching and Examination**Courses Taught*

Smart Cities, Tel-Aviv University, Masters in Architecture, Tel-Aviv, Israel, June, 2013, <http://www.spatialcomplexity.info/>

Spatial Modelling and Simulation: Complexity, CA, and ABM: CASA MRes, UCL, February - March, 2013, <http://www.spatialcomplexity.info/>

Smart Cities, Arizona State University, GCU 598 (28167) and PUP 598 (28168), Tempe, AZ, January-February, 2013, <http://www.spatialcomplexity.info/>

Spatial Modelling and Simulation: Urban Modelling, CASA MRes, UCL, January - March, 2012, <http://www.spatialcomplexity.info/>

Spatial Complexity, Arizona State University, GCU 598 (28167) and PUP 598 (28168), Tempe, AZ, October - Nov, 2011, <http://www.spatialcomplexity.info/>

Urban Simulation: Methods, Models and Planning Applications, Department of Geography, Ritsumeikan University, Kyoto, Japan, October 12th - October 15th, 2010, <http://www.casa.ucl.ac.uk/rits/>

Advanced Urban Modeling, Arizona State University, GCU 598 (28167) and PUP 598 (28168), Tempe, AZ, April 26 - May 7, 2010, <http://www.casa.ucl.ac.uk/asu/>

Cyberspace: The Geography and Planning of Virtual Worlds, (BSc3: Geography; BSc2 and 3: Bartlett Planning), 1999-2001 (UCL)

Methods for Human Geographers (BSc2: Geography), 1998-2001 (UCL)

Practice of Geography (BSc2: Geography), 1997-1998 (UCL)

Planning Analysis (BSc 2: Bartlett Planning, MPhil Planning from 1998), 1997-1998 (UCL)

Methods for Geographers (B113: BA1/BSc1: Geography), 1996 (UCL)

GIS for Planners (BSc2/BSc3: Bartlett Planning), 1996 (UCL)

The Geography of the Information Society (GEO666), 1995 (Buffalo)

Introduction to Geographic Information Systems (GEO481), 1994 (Buffalo)

World Civilization Post 1500 (UGC112B), 1992-1994 (Buffalo)

Land Use-Transport Models (GEO674), 1991-1993 (Buffalo)

Transportation Systems (GEO335), 1991 (Buffalo)

Urban Design (BSc1), 1986-1990 (Cardiff)

Microcomputer Applications in Planning (MSc2/DipTP2), 1984-1990 (Cardiff)

Planning Methods (MSc1), 1979 -1990 (Cardiff)

Introduction to Planning Methods (BSc1), 1979-1986 (Cardiff)

Research Methods (Scientific Method) (BSc2/MSc1), 1979-1986 (Cardiff)

Quantitative Methods (MSc2), 1979-1980 (Cardiff)

Planning Techniques (BSc2), 1979-1980 (Cardiff)

Introduction to Contemporary Planning (MSc1), 1979-1980 (Cardiff)

Planning Processes (MSc/MPhil), 1976-1979 (Reading)

Land Use Models (MAsc), 1974-1975 (Waterloo)

Information Theory (MAsc), 1974-1975 (Waterloo)

Urban Land Use Models (MSc), 1973-1979 (Reading)

Theory and Practice of Planning (MSc), 1973-1979 (Reading)
 Spatial Interaction (BSc2), 1973-1979 (Reading)
 Central Place Theory (BSc2), 1972-1974 (Reading)
 Urban Economics (BSc2), 1972-1976 (Reading)
 Urban Design and Regional Planning (BA4), 1966-1969 (Manchester)

Research Student Advisor (PhDs/MPhils Completed)¹

Fabian Neuhaus (PhD UCL 2013): *Urban Rhythms: Habitus and Emergent Spatio-Temporal Dimensions of the City*
 Dong Han Kim (PhD UCL 2012): *Modelling Urban Growth: Towards an Agent Based Microeconomic Approach to Urban Dynamics and Spatial Policy Simulation*
 Varina Delrieu (PhD UCL 2012): *GIS-Based Indicators for the Social Impact of Mega Urban Transport Projects*
 Duncan Smith (PhD UCL 2011): *Polycentricity and Sustainable Urban Form: An Intra-Urban Study of Accessibility, Employment and Travel Sustainability for the Strategic Planning of the London Region*
 Basak Demires Ozkul (PhD UCL 2011): *Changing Settlement Patterns For Home and Work in England and Wales: 1981-2001*
 Jon Reades (PhD UCL 2011): *The Place of Telecommunications: Spatial Decision-Making by Firms in the Age of Global Communications*
 Yi Gong (PhD UCL 2009): *Exploring Children's Movements: An Investigation of GPS Tracking in the Local Environment*
 Toofan Hagani (PhD BCU 2009): *Complexity Theory, Fractal Geometry and the Nature of Urban Morphological Evolution*
 Lucas Figueiredo (PhD UCL 2009): *Continuity Lines, An Investigation of Urban Form Through Street Networks*
 Kazuki Nakamura (PhD UCL 2009): *The Effect of Area-Wide Pedestrianisation on Town Centre Attractions*
 Martin Dodge (PhD UCL 2008): *Understanding Cyberspace Cartographies: A Critical Analysis of Internet Infrastructure Mapping*
 Theodore Zamenopoulos (PhD UCL 2008): *Design out of Complexity: A Mathematical Theory of Design as a Universal Property Of Organization*
 Victor Schinazi (PhD UCL 2008): *Representing Space: The Development, Content and Accuracy of Mental Representations by the Blind and Visually Impaired*
 Andrew Crooks (PhD UCL 2007): *Experimenting with Cities: Utilizing Agent-Based Models and GIS to Explore Urban Dynamics*
 Katerina Alexiou (PhD UCL 2007): *Understanding Multi-Agent Design as Coordination*
 Ian Greatbatch (MPhil UCL 2007): *Issues in Retail Centre Definition*
 John Ward (PhD UCL 2007) *Urban Movement - Models of Pedestrian Activity*
 Nancy Chin (PhD UCL 2007) *Spatial Analysis and the Measurement of Urban Sprawl*
 Joana Margarida de Alameda Simões (PhD UCL 2007) *An Agent-Based Approach to Spatial Epidemics through GIS*
 Kampanart Piyathamrongchai (PhD UCL 2006) *A Dynamic Settlement Simulation Model: Applications to Urban Growth in Thailand*
 Maria Attard (PhD UCL 2006) *Coping with Change. The Problems of Adopting Sustainable Transport Policies in the Small Island State of Malta*
 Chao Li (PhD UCL 2005) *Pedestrian WayFinding Using Mobile Devices*
 Naru Shiode (PhD UCL 2005): *Information Spaces in Urban Society: Analyses of Real and Virtual Worlds and Utilisation of Cyberspaces*
 Daryl Lloyd (PhD UCL 2005): *Uncertainty in Town Centre Definition*
 Joana Barros (PhD UCL 2004): *Urban Growth in Latin American Cities: Exploring Urban Dynamics through Agent-Based Simulation*
 Kang-Rae Ma (PhD UCL 2004) *The Impact of Urban Spatial Decentralisation on Jobs-housing Imbalance*
 Sanjay Rana (PhD UCL 2004): *Surface Networks: New Techniques for the Automated*

¹ I am currently responsible for 3 active and 3 completing PhDs in CASA.

Extraction, Generalisation and Application

Paul Torrens (PhD UCL 2003): *Simulating Sprawl: A Dynamic Entity-Based Approach to Modeling North American Urban Sprawl Using Cellular Automata and Multi-Agent Systems*

Andy Hudson-Smith (PhD UCL 2003): *Digitally Distributed Urban Environments: The Prospects for Online Planning*

Nick Green (PhD UCL 2002): *From Factories to Fine Art - The Origins and Evolution of East London's Artists' Agglomeration 1968-98*

Muki Haklay (PhD UCL 2002): *Public Environmental Information Systems: Challenges and Perspectives*

David O'Sullivan (PhD UCL 2000): *Graph-based Cellular Automaton Models of Urban Spatial Processes*

David Howes (PhD SUNY-Buffalo 1999): *Modeling Runoff in a Desert Shrubland Ecosystem, Jornada Basin, New Mexico*

Masanao Takeyama (PhD University of California-Santa Barbara 1996): *Geoalgebra: A Mathematical Approach to Integrating Spatial Modeling and GIS*

Pat Pelligrini (PhD SUNY-Buffalo 1996): *Migration Modeling using the PUMS, 1985-1990*

Anne Deakin (PhD SUNY-Buffalo 1996): *The Impact of the 1994 Northridge Earthquake on Los Angeles Motorists*

Frank Xia (PhD SUNY-Buffalo 1995): *Three Dimensional GIS for Environmental Modeling*

Tim Pitts (PhD SUNY-Buffalo 1994): *Inter-Port Competition and Cargo Tributary Areas for International Containerized Exports from the United States*

Feibing Zhan (PhD SUNY-Buffalo 1994): *Spatio-Temporal Location Models of Mobile Trading and the Organization of Periodic Market Places*

Yichun Xie (PhD SUNY-Buffalo 1994): *Analytical Models and Algorithms for Cellular Urban Dynamics*

Betty E. Smith (PhD SUNY-Buffalo 1994): *Urban Morphology in South America*

Yuemin Ding (PhD SUNY-Buffalo 1993): *Strategies for Parallel Spatial Modeling Using MIMD*

Kim Chan Nam (PhD Wales 1992): *Freight Transport and Commodity Flows in the South Korean Space Economy*

Simon Thompson (MPhil Wales 1990): *Fractal Representation in Computer Cartography*

Harry Dimitriou (PhD Wales 1989): *A Development Approach to Transport Planning in the Third World*

Rajah Ratnam (PhD Wales 1988): *A Theoretical Model for the Selection and Examination of Bus Priority*

Stephen Cropper (PhD Wales 1986): *Structural Models of the Design Process*

Augustin Rodriguez-Bachiller (PhD Reading 1984): *Contiguous Urban Growth*

Derek Constable (PhD Reading 1984): *Urban Dynamics: Critique and Application to Three English Towns*

Barend Linders (PhD Reading 1982): *Decision Making in Regional Planning*

Ronald Botham (PhD Reading 1981): *Road Investment and Regional Development: A Case Study of the Impact of the British Road Programme 1957-1972*

Erlet Cater (PhD Reading 1981): *The Impact of the M4 Motorway on Residential Location in the Reading Subregion*

Raymond Wyatt (PhD Reading 1975): *A Computer Search Technique for Complex Urban Strategy Formulation*

Nicholas Bather (PhD Reading 1973): *Residential Location: The Spatial Distribution of Growth and the Role of the Developer in the Subregional Housing Market*

External Examining: Degree Courses

University of Leeds, MA/MSc in Geographical Information Systems, 2002 to 2005

University of Cambridge, MPhil in Geographical Information Systems, 2001 - 2004,

MPhil in Human Geography, 2002 - 2004

University of Leicester, MSc in Geographical Information Systems, 1997-2000
 University College London, MSc in Advanced Architectural Studies, 1989-1993
 Queens University, Belfast, MSc in Town and Country Planning, 1988-1991
 University of Sheffield, MA in Town and Regional Planning, 1987-1990
 University of Technology Malaysia, BSc in Urban Planning Studies, 1987-1989
 University of Strathclyde, BA in Planning Studies, 1986-1990
 Imperial College and University College, London, Intercollegiate MSc in Transport Planning, 1985-1987
 University of Manchester, BA in Town and Country Planning, 1984-1988
 Oxford Polytechnic, BA in Planning Studies, 1984-1988
 Birmingham Polytechnic, BA in Town Planning, 1983-1987
 Leeds Polytechnic, MA in Environmental Planning Studies, 1981-1986
 University of Bristol, BSc in Geography, 1981-1984
 University of Dundee, BSc in Town and Regional Planning, 1980-1982
 University of Liverpool, MCD in Town and Regional Planning, MA in Regional Science, 1980-1983
 University of Wales Institute of Science and Technology, BSc in Town Planning Studies, 1978-1979
 University of Aston, MSc in Environmental Planning and Design, 1977-1979
 University of Hong Kong, MSc in GIS, 2007 to 2009
 Kingston University, MSc in GIS, 2008 to 2011
 University of Southampton, MPhil in Remote Sensing and Spatial Analysis, 2008 to 2011

Research Degrees : Masters (MA, MSc and MPhil)

Royal Melbourne Institute of Technology, Department of Business, 1999
 Cranfield Institute of Technology, Centre for Transport Studies, 1986; IERC, 1996
 Royal College of Art, Department of Design Research, 1985
 University of Nottingham, Department of Mathematics, 1976
 Victoria University of Wellington, Architecture, Building Science and Design, 2008

Research Degrees : Doctorates (PhD)

University of Southampton, Department of Geography, 2007
 City University, London, School of Information Sciences, 2007, 2008
 Instituto Nacional de Pesquisas Espaciais (INPE), Sao Jose dos Campos, Brazil, 2003
 Heriot-Watt University, School of Mathematics and Computer Science, 2003
 University of London, Imperial College, Huxley School, 2002
 University of London, Queen Mary, 2001
 University of Wales, Cardiff, Department of City and Regional Planning, 2000, 2010
 University of Roorkee, Department of Civil Engineering, 1999
 University of London, London School of Economics, 1999
 University of Lancaster, Business School, 1998
 Oxford Brookes University, Department of Planning, 1997, 2000
 University of Sheffield, Department of Town and Regional Planning, 1997
 University of Hong Kong, Centre for Urban Studies, 1996
 University College Dublin, Center for Environmental Policy, 1991
 University of London, Imperial College, Department of Civil Engineering, 1987
 University of Leeds, Institute for Transport Studies, 1987
 University of Liverpool, Department of Civic Design, 1986
 Open University, Faculty of Technology (Design Discipline), 1985, 2008
 University of Newcastle-upon-Tyne, Department of Town and Country Planning, 1984, 2003, School of Civil Engineering and Geosciences, 2004
 University of London, University College London, The Bartlett, 1983, 1997 (2), 1998, 1999, 2007, 2010, 2012, 2013
 University of Strathclyde, Department of Urban and Regional Planning, 1983
 University of Queensland, Department of Regional and Town Planning, 1983, 1986
 University of Edinburgh, Department of Urban Design and Regional Planning, 1982

University of Newcastle, New South Wales, Department of Mathematics, 1981,
 Department of Civil Engineering, 1996
 University of New South Wales, Sydney, Faculty of the Built Environment, 2008
 Cranfield Institute of Technology, Centre for Transport Studies, 1980; IERC, 1997,
 1998, 1999, 2008
 Royal College of Art, Department of Design Research, 1980
 University of Warwick, Department of Engineering Science, 1979
 University of Leeds, School of Geography, 1977, 1978, 1982, 1985, 1999, 2001, 2004,
 2008, 2012
 University of Bristol, Department of Geography, 1977, 1978, 1980, 1984, 1989, 1997
 University of Cambridge, School of Architecture, 1977, 1978, 1979, 1980 (twice),
 1981, 1982, 1990, 2002, Department of Land Economy, 2011, Department of
 Geography, 2013
 University of Waterloo, Ontario, Department of Civil Engineering, 1975, 1978, 1979,
 1980
 Université Catholique de Louvain, Louvain-la-Neuve, 2004-2005
 Université de Nantes and CERMA UMR CNRS 1563 Ecole d'Architecture de Nantes, 2004
 Chalmers University, Department of Physical Resource Theory, 2005
 University of Auckland, Department of Geography, 2005
 Eindhoven Institute of Technology, Faculty of the Built Environment, 2006, 2008
 Chinese University of Hong Kong, Department of Geography, 2006-7
 Wageningen University, Department of Planning, 2006
 Delft University of Technology, Faculty of Architecture, 2007, 2008
 Università degli Studi di Milano Bicocca, Computer Science, Milan, Italy, 2007
 University of the West of England (UWE), Faculty of the Built Environment, December
 2007
 University of Calgary, Alberta, Canada, Department of Geomatics Engineering,
 January 2008
 Royal Institute of Technology (KTH), Stockholm, Sweden, October, 2008, 2011
 Institute of Space and Earth Information Science, Chinese University of Hong Kong,
 June 2009
 University of Tampere, Department of the Built Environment, Finland, February 2010
 University of Amsterdam, Department of Urban Studies, Netherlands, March 2010
 University of Surrey, Department of Sociology, April 2010
 Memorial University, Newfoundland, Canada, Department of Geography, September
 2010
 University of Zaragoza, Spain, Department of Analytical Economics, December 2010

Research Degrees : Higher Doctorates (HDR, ScD, & DSc)

Université Louis Pasteur, Strasbourg, Department of Geography, 2005
 The University of Cambridge, School of Architecture, 1985
 The University of Bristol, Department of Geography, 1981

Assessor for Readership and Chair Appointments

Concordia University 2001; University of Illinois at Chicago 2001; Royal Holloway
 1999; University of Southampton 1999 2000; University of California at Los Angeles
 1998 2003; MIT 1998; University of California at Berkeley 1998; University of Iowa
 1997; Royal Holloway 1997; University of Leicester 1997; Georgia Institute of
 Technology 1997; University of Pennsylvania 1997; Anglia Polytechnic University 1997;
 University of Connecticut 1996; University of Nova Scotia 1996 1997; University of
 Ottawa 1996; University of Lancaster 1996 1999; University of Wales 1995 1996 1999
 2000; University of Manchester 1994; University of Leeds 1993 1999; Universiti Sains
 Malaysia 1992; University of Liverpool 1992 1994; Loughborough University 1991;
 University of Cambridge 1990 1992; University of California at Santa Barbara 1990
 1996; University of Wales 1989 1994; University of Leeds 1988 1989 1991; University
 of Queensland 1987; University of Hong Kong 1987 1988 1990 1991 1994; Open

University 1986; Coventry Polytechnic 1986; Ohio State University 1985; University of Virginia 1985; University College London 1984 1985 1989 1990 1995 1997; University of Illinois 1984 1990; I was UGC assessor for the 'new blood' lecturer appointments in my field 1983-1985.

I am no longer keeping a record an updated record in my CV of this advice. The number and nature of the Chair appointments in the UK university system has changed and requests for such references are now routine.

Research Activities: Editorial

Editor, **Environment and Planning B** since 1985; Co-editor 1981-1985.

Member, Editorial Advisory Boards

Current

Landscape Research 2001
URISA Journal 2000
Transactions in GIS 1998
Regional Development Studies 1997
Applied Geography 1996
Discrete Dynamics 1997
International Planning Studies, 1995
Computers, Environment, & Urban Systems 1992
Spatial Analysis & Policy Applications 2007
Annals of GIS, 2007
Complex Networks, 2013

Previous

Regional Studies 1971-1997
Socio-Spatial Dynamics 1990-1996
Geographical Analysis 1985-1988
Geography Review 1987-1991
Annals of Regional Science 1979-1988
Journal of Planning Literature 85-96
Sistemi Urbani 1978-1990
Environments 1985-1990
Geographical Research Forum 1982-5
Land Use and Transport 2007 to 2012

I have reviewed articles submitted to the following journals as well as for those I have been concerned with through the editorial board: **Applied Geography, Area, Annals of Regional Science, Annals of the Association of American Geographers, Building Research and Information, Bulletin of Mathematical Biology, Cartographica, Cartographic Journal, CATMOG, Construction Management and Economics, Demography, Development Studies, Economic Geography, Environment and Planning A, B and C, Environmental Science and Policy, European Journal of Operational Research, European Planning Studies, Europhysics Letters, Geographical Systems, IEEE Transactions on SMC, Information Communication and Society, International Journal of Geographical Information Systems, International Regional Science Review, Journal of the American Planning Association, Journal of Economic Behavior and Organization, Journal of Economic Geography, Journal of Geography in Higher Education, Journal of Industrial Ecology, Journal of Planning Theory, Journal of Regional Science, Journal of the Royal Town Planning Institute (The Planner), Journal of Theoretical Biology, Journal of Urban Design, Land Use Policy, Landscape and Urban Planning, Letters in Spatial and Resource Sciences, Management Science, Mathematical Population Studies, Mosaic Journal, Nature, PNAS, Proceedings of the Royal Society A, Papers in Regional Science, Photogrammetric Engineering and Remote Sensing, Physical Review Letters, Physical Review E, Physica A, Physica D, Social Sciences and Information Studies, Professional Geographer, Presence, Psychological Reports: Perception and Motor Skills, Progress in Human Geography, Progress in Planning, Public Library of Science (PLOS) One, Regional Development Studies, Town Planning Review, Third World Planning Review, Transactions of the Institute of British Geographers, Transportation, Transportation Research A, B, and C, Urban Geography, Urban Studies.**

I have reviewed proposals for books and journals for the following publishers: Allen and Unwin, Addison-Wesley, Blackwells, Butterworths, Cambridge University Press, Chapman and Hall, Croom Helm, Gordon and Breach, Guilford Press, Hutchinson, Longmans, Methuen, MIT Press, Oxford University Press, Pergamon, Pion, Prentice-Hall, Rowman and

Littlefield, Routledge, Sage, Spon, Springer, Taylor and Francis, and John Wiley.

Research Activities: Grants Awarded

I have received many small grants and consultancies for CASA not detailed here, a list of which might be obtained from casa@ucl.ac.uk and from our web site www.casa.ucl.ac.uk

EU-FP7: INSIGHT: Innovative Policy Modelling and Governance Tools for Sustainable Post-Crisis Urban Development £422K to UCL, 1/10/2013 - 30/9/2016
 ESRC: LS-CeLSiuS: The Longitudinal Study: £156K to CASA, 1/10/2012- 30/9/2017
 EU-FP7: EUNOIA Project: Evolutive User-centric NetwOrks in Intraurban Accessibility: 2012-2014: 275K euros to UCL, 1/10/2012-30/9/2014
 ESRC: TALISMAN (geospaTial datA anaLysIS & siMulAtioN): ES/I025634/1: 2011-2014: £662,334
 EPSRC: ANALOGIES (Analogues of Cities): EP/I016791/1, 2010-2012: £249,000
 European Research Area Network (ERA-NET) Complexity-NET: COSMIC (COmplexity in Spatial DynaMICs): EP/I018433/1, 2010-2012: 498,245 Euros (236,447 to UCL) (£181,094)
 ERC (European Research Council): The MECHANICITY Project (Morphology, Energy & Climate cHAnge In the CiTY): 249393 ERC-2009-AdG., 2010-2015: 2,393,243 Euros (£1,869,444)
 EPSRC: ENFOLD-ing (Explaining, modelliNg, and FOrecasting gLobal Dynamics): EP/H02185X/1, 2010-2015: £2,954,027
 EPSRC: SCALE (SMALL CHANGES LEAD TO LARGE EFFECTS): Changing Energy Costs in Transport and Location Policy): EP/G057737/1 2009-2012, £823,922
 EPSRC: ARCADIA: Adaptation and Resilience in Cities: Analysis and Decision making using Integrated Assessment: EP/G060983/1 2009-2012: £109,883
 ESRC: GENeSIS: Generative e-Social Science for Social-Spatial Simulation, RES-149-25-1078, 2008-2012, £1.81m (with the Centre for Spatial Analysis and Policy, University of Leeds)
 GLA Economics: Research Fellowship in Urban Systems: £105,000, 2007-2010
 EPSRC: LUCID: The Development of a Local Urban Climate Model and its Application to the Intelligent Development of Cities, 2007-2010, part of £608,175 to UCL
 NERC/EPSC/ESRC: Tyndall Centre Phase 2: Cities Research Theme, 2006-2007, £27,924
 ESRC: e-Social Science Hub: The GEOVUE Project, RES-149-25-102, 2005-2008: ~£400,000
 BOC (British Oxygen) Foundation: Pollution and Virtual London, 2005-1006: £25,000 of £50,000 with Kings College Environment Research Group and APRIL
 London Connects, GLA and ODPM: Virtual London Project: 2003-2004: 2005-2006 ~£50,000
 EPSRC: Spatially Embedded Complex Systems Engineering (SECSE): 2004-2009: £333,000 of £1.6m
 EPSRC: Children's Activities, Perceptions and Behaviour in the Local Environment (CAPABLE): 2004-2006, £120,885 of £385,900
 EU/Interregio: ESPON: European Spatial Observation Network: 2003 -2005: £37,000
 ESRC (Economic and Social Research Council): Urban Growth and Complexity, 2002 - 2005, £109.345 (Research Fellowship Teaching Replacement)
 EPSRC (Engineering and Physical Sciences Research Council): The Retail Systems Environment, 2001 - 2002, £45,000
 EU: SCATTER: Sprawling Cities And TransporT: from Evaluation to Recommendations, European Commission Fifth Framework Programme, Proposal n° EVK4-2001-00083, 2002- 2004, £92,678
 JISC (Joint Information Systems Committee): DNER Digital Egypt for Universities (with UCL Petrie Museum), 2000 -2003, £178,343
 ESRC (Economic and Social Research Council): Multi-Agent Approaches to Urban Development Dynamics, 1999 - 2004, £181,515 (Part of the ESRC Priority Network in

Complex and Dynamic Processes)

EPSRC (Engineering and Physical Sciences Research Council): The Sustainable Town Centre, 1999 - 2001, £108,000

EPSRC (Engineering and Physical Sciences Research Council): Partnerships in the Public Understanding of Science, The Virtual City, 1999 - 2000, £19,000

ESRC (Economic and Social Research Council) Evaluation of the ESRC-JISC 1991 Census Programme, 1998 - 1999, £10,000

Department of the Environment: The Definition of Town Centres: Pilot Project, Planning and Land Use Statistics Division, Planning Research Programme 1998-2001, £278,000.

Office of Science and Technology, Department of Trade and Industry and EPSRC, Technology Foresight Challenge: A Virtual Reality Centre for the Built Environment, £980,000, 1997-2000

Department of the Environment: The Definition of Town Centres: Planning and Land Use Statistics Division, Planning Research Programme 1996-1997, £94,000

JISC (Joint Information Systems Committee) JTAP The VENUE Project: Virtual Environments for Urban Environments, HEFCE, £150,000, 1996-1998

The National Science Foundation Collaborative Grant: Three Dimensional Modeling of Fish Populations in Lake Ontario (with Buffalo State College Great Lakes Center and the NCGIA at SUNY-Buffalo): \$73,000, 1995-1996

Sun Microsystems, Workstation Equipment for the Geographic Information and Analysis Laboratory: \$80,840, 1991-1992

The National Science Foundation Core Grant for the NCGIA at SUNY-Buffalo, Fourth Year Renewal: \$3.3m , 1991-1992; Fifth Year Renewal: \$3.6m, 1992-1993; Sixth Year 1993-1994: \$3.4m; Seventh Year 1994-1995; \$3.4m

Continuing Professional Development for Planning Practice, South Wales Branch of the Royal Town Planning Institute, RTPI 1988-1990: £3400

Regional Research Laboratory for Wales and South West England (held jointly with I. Bracken, P. A. Longley and N. Wrigley) : ESRC 1986-1991: £19,900 (Pilot Project); £232,000 (Full Project)

'New Blood' Lectureship awarded to UWIST (1984-1989) in the area of my research 'Computer Modelling in Urban and Regional Planning': recipient Dr. P. Longley, £82,000

Spatial Interaction Analysis: Leverhulme Trust Visiting Commonwealth Research Fellowship Award to UWIST 1981-1982: £4860

Formal Models of the Planning Process: A Test of Coleman's Model: SSRC 1981-1983: £13,900

Information Theory in Spatial Aggregation and Modelling: SSRC 1980-1981: £9470

Systems Analysis in Urban Policy Making and Planning: NATO Advanced Research Institute, Brussels, Belgium (held jointly with Dr. B.G. Hutchinson, University of Waterloo): 1978-1983, conference held New College, Oxford 1980: \$22,500

The Design of Geographical Systems for Land Use and Transport Modelling: SSRC 1974-1975: £4650

Research Activities: Grants Assessment

I have reviewed many grant proposals for the Austrian Research Council, the Australian Research Council, the British Academy, The Royal Society, the National Science Foundation (NSF), Canada Council, ETH (Zurich), The Israeli Research Foundation, the Swiss Research Council, EPSRC, ESRC, NERC, the Arts and Humanities Research Board (AHRB), the Nuffield Foundation, and the Leverhulme Foundation.

Research Activities: Conference Organization

The Comparative Genetics of Cities, with ASU and Newcastle Universities, held at UCL, May 21-24th 2010

Virtual Geographic Environments: An International Conference on Developments in Visualization and Virtual Environments in Geographic information Systems, Chinese

University of Hong Kong, January 2008
 The Ninth International Conference on Computers in Urban Planning and Urban Management, UCL, June-July 2005
 The Eighth International Conference on Computers in Urban Planning and Urban Management, Sendai, Japan, June 2003
 The Sixth International Conference on Computers in Urban Planning and Urban Management, University of Venice, September 1999
 Measuring and Representing Accessibility in the Information Age, NCGIA Varenus Workshop, Pacific Grove CA, November 1998 (Steering Group)
 The Fifth International Conference on Computers in Urban Planning and Urban Management, IIT, Powai, Bombay, December 1997
 NCGIA Specialist Workshop on Spatial Technologies, Geographic Information, and the City, Baltimore, Maryland, September 1996
 The Fourth International Conference on Computers in Urban Planning and Urban Management, University of Melbourne, Australia, July 1995
 GIS and Spatial Modelling, a workshop supported by ESRC and NCGIA held at the University of Bristol, UK, June 1994
 The Third International Conference on Computers in Urban Planning and Urban Management, Georgia Institute of Technology, Atlanta, July 1993
 Fourth International Workshop on Technological Change and Urban Form: Productive and Sustainable Cities, University of California at Berkeley, April 1993
 The Second International Conference on Computers in Urban Planning and Urban Management, Oxford Polytechnic, Oxford, UK, July 1991
 Third International Conference on Innovation, Technological Change and Spatial Impacts, Selwyn College, University of Cambridge, September, 1989
 The First International Conference on Computers in Urban Planning and Urban Management, University of Hong Kong, August 1989
 British Computer Society Computer Graphics and Displays Group, Meeting on The State of the Art in Computer Cartography, London, November 1987
 British Computer Society Computer Graphics and Displays Group, Meeting on Graphics for Designers, London, January 1987
 British Section of the Regional Science Association, Computer Methods Sessions, Annual Conference, University of Manchester, September 1985
 International Workshop on Innovation, Technological Change and Spatial Impacts, CSIRO, Melbourne, Australia, August 1985
 RTPI Conference on Information Technology in Planning, South Bank Polytechnic, October 1983
 New Directions in Urban Modelling, An International Conference organized at the University of Waterloo, Ontario, July 1983
 New Technology and Urban Form, An International Seminar organized in association with CSIRO Melbourne, held at the University of Waterloo, Ontario, July 1983
 NATO Advanced Research Institute on Systems Analysis in Urban Policy-Making and Planning, New College, Oxford, September 1980
 PARC '79, Planning, Architecture and Computers: An International Conference organized with Online Conferences, Berlin, May 1979

I have presented many lectures at UK, overseas universities, and professional forums during my academic career. A list of these is not included here but available if required.

Professional Practice and Academic Consulting

CASA currently has a number of consulting projects with a research emphasis organized through UCL Business which are part of our wider research. All such contracts have been so organised in this way in the last 10 years and are thus not listed here

Consultant to the ESRC Policy and Evaluation Division, Swindon, UK, Evaluation of the ESRC-JISC 1991 Census of Population Programme January - June 1999
 Consultant to the Open University, Cities and Technology: From Babylon to Singapore

Course: Preparation of the Audi Cassette: Wired Cities, Virtual Cities, December 1998
Consultant to the MedStar Project on the impact of IT on the future development of Arriyadh, Arriyadh Development Authority, Arriyadh, Saudia Arabia September 1998
Consultant to the project "Urban Simulation for Sustainable Development in the Pearl River Delta", Centre for Urban Planning and Environmental Management, University of Hong Kong, and the Institute of Geography, Guanzhou Academy of Sciences December 1997
Consultant to the INIFAP (Instituto Nacional de Investigaciones Forestales Y Agropecuaris), Mexico City, on GIS Systems for Forest Planning July 1994
Course Lecturer, Geographical Information Systems in Urban and Regional Planning, UNCRD, University of Hong Kong, and The Commonwealth Association of Planners, Center for Urban Planning and Environmental Management, University of Hong Kong July - August 1991
Consultant to UNESCO, PGI Programme, Paris, on Information for Planning and Decision-Making 15 March 1990 - 15 March 1991 (Paris and Beijing)
Consultant to UNESCO on the Training Course in Information Systems for Subnational Development Planning December 1989 - April 1990 (Paris and Los Banos, Philippines)
Consultant to the United Nations Centre for Regional Development, Nagoya, Japan on the UNCRD Research Project on Developing Strategies for Integrating Information Systems/Technology and Local/Regional Planning in Developing Countries January 1989 - March 1989
Consultant to Cardiff Bay Development Corporation, Socio-Economic Profile Project 1988
Consultant to OECD Group on Urban Affairs, Environment Division, on Urban Policy Impacts of Technological, Social & Economic Change 1986-1987
Consultant to BBC-TV Tomorrows World Programme, 27th June 1985: Item on "Fractals"
Consultant to the SERC/ESRC Joint Transport Committee, Program Grant Application, Institute of Transport Studies, University of Leeds 1979 and 1979-1982 (Steering Committee)
Consultant to the Open University, Faculty of Technology, Program Series: Modelling by Mathematics (TM281): Program 5: Shopping Models 1976-1977
Consultant to Colin Buchanan and Partners, Midden Randstadt Subregional Study 1973-1976
Consultant to the Berkshire, Hampshire and Surrey County Council, Area 8 Subregional Study 1973-1974

*Part 2: Publications**In reverse chronological order**Books*

- 2013 **The New Science of Cities**, The MIT Press, Cambridge, MA, in press.
- 2005 **Cities and Complexity: Understanding Cities with Cellular Automata, Agent-Based Models, and Fractals**, The MIT Press, Cambridge, MA, xxiii + 565 pp.
- 1994 **Fractal Cities: A Geometry of Form and Function**, Academic Press, London and San Diego, CA, xxii + 394 pp. (with P. A. Longley).
- 1987 **Microcomputer Graphics : Art, Design and Creative Modelling**, Chapman and Hall, London and New York, xii + 331 pp.
- 1976 **Urban Modelling: Algorithms, Calibrations, Predictions**, Cambridge University Press, Cambridge, xxv + 381 pp.

Edited Books

- 2012 **Agent-Based Models of Geographical Systems**, DOI 10.1007/978-90-481-8927-4_37, Springer, Berlin and New York, xx + 732 pp. (co-edited with A. J. Heppenstall, A. T. Crooks and L. M. See)
- 2011 **Environment and Planning: Volume B: Planning and Design**, Sage, London, 513+xxvi (co-edited with Longley, P. A.)
Environment and Planning: Volume E: Foundations, Sage, London, 527+xv, (co-edited with Elden, S., Thrift, N., Barnes, T. J., Peck, J., Longley, P. A. and Bennett, R. J.)
Virtual Geographic Environments, Science Press, Beijing, China, vi + 350 pp. (co-edited with H. Lin), 2009, 2011 published by ESRI Press, Redlands, CA, vi + 350 pp. 2011.
- 2005 **GIS, Spatial Analysis, and Modeling**, ESRI Press, Redlands, CA, xiii + 480 pp. (co-edited with D. J. Maguire and M. F. Goodchild).
- 2003 **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, viii + 463 pp. (co-edited with P. A. Longley).
- 1996 **Spatial Analysis: GIS in a Modelling Environment**, GeoInformation International and John Wiley, Cambridge, UK, viii + 392 pp. (co-edited with P. A. Longley).
- 1995 **Cities in Competition: Productive and Sustainable Cities for the 21st Century**, Longman Australia Melbourne, London and New York, xii + 532 pp. (co-edited with J. Brotchie, E. Blakely, P. Hall, and P. Newton).
- 1991 **Cities of the 21st Century: New Technologies and Spatial Systems**, Longmans, London and Halsted Press, New York, xiii + 446 pp. (co-edited with J. Brotchie, P. Hall, and P. Newton).
- 1987 **Advances in Urban Systems Modelling**, North-Holland Press, Amsterdam, xi + 432 pp. (co-edited with B. G. Hutchinson).
- 1985 **Optimization and Discrete Choice in Urban Systems**, Springer-Verlag, Berlin, vi + 371 pp. (co-edited with B. G. Hutchinson and P. Nijkamp).
- 1983 **Systems Analysis in Urban Policy-Making and Planning**, Plenum Press, New York, xii + 619 pp. (co-edited with B. G. Hutchinson).

Chapters in Books

- 2013 **Great Planning Disasters: How We Should Tackle Complexity By Taming Wicked Problems**, in M. Tewdwr-Jones, N. Phelps (Editor), and R. Freestone (Editors) **The Planning Imagination: Peter Hall and the Study of Urban and Regional Planning**, Routledge, London, forthcoming.
 (with Smith, D. A., and Vargas-Ruiz, C.) **Simulating the Spatial Distribution of Employment in Large Cities: With Applications to Greater London**, in Pagliara, F., de Bok, M., Simmonds, D., and Wilson, A. (Editors) **Employment Location in Cities and Regions: Models and Applications**, Springer, Berlin, 79-106.
- 2012 M. Batty and A. Hudson-Smith (2012) **Discussions on Systemic Architecture: The**

- Liquid City, in M. Poletto and C. Pasquero (Editors) **Systemic Architecture: Operating Manual for the Self-Organising City**, Routledge, London, 18-20.
- Integrated Tools for Planning Support in an Online World, in Bazzanella, L., Caneparo, L., Corsico, F., and Roccasalva, G. (Editors) **The Future of Cities and Regions: Simulation, Scenario and Visioning, Governance and Scale**, Springer Science+Business Media B.V. 2012, Berlin. DOI 10.1007/978-94-007-2518-8_17, pp. 349-358.
- (with A. T. Crooks, L. M. See and A. J. Heppenstall) Perspectives on Agent-Based Models and Geographical Systems, Chapter 1 in A. J. Heppenstall, A. T. Crooks, L. M. See and M. Batty (Editors) **Agent-Based Models of Geographical Systems**, Springer, Berlin and New York, pp. 1-18.
- (with A. J. Heppenstall, A. T. Crooks, and L. M. See) Reflections and Conclusions: Geographical Models to Address Grand Challenges, Chapter 37 in A. J. Heppenstall, A. T. Crooks, L. M. See and M. Batty, (Editors) **Agent-Based Models of Geographical Systems**, Springer, Berlin and New York, pp. 739-747.
- A Generic Framework for Computational Spatial Modelling, Chapter 2 in A. J. Heppenstall, A. T. Crooks, L. M. See and M. Batty, (Editors) **Agent-Based Models of Geographical Systems**, Springer, Berlin and New York, pp. 19-50.
- (with S. Marshall) The Origins of Complexity Theory in Cities and Planning. In J. Portugali, Meyer, H., Stolk, E., and Tan, E. (Editors) **Complexity Theories of Cities Have Come of Age**, Springer-Verlag, Berlin and Heidelberg, DOI 10.1007/978-3-642-24544-2_3, pp. 24-47.
- 2011 (with Davies, L., Kwiatkowski, L., Gaston, K. J., Beck, B., Brett, H., Scholes, L., Wade, R., Sheate, W. R., Sadler, J., Perino, G., Andrews, B., Kontoleon, K., Bateman, I., and Harris, J. A.) Urban, Chapter 10, In: UK National Ecosystem Assessment (Edited) **The UK National Ecosystem Assessment Technical Report**, UNEP-WCMC, Cambridge, UK, 361-410.
- (with Longley, P. A.) Environment and Planning B: Perspectives on the Development of an Idea, in Batty, M., and Longley, P. A. (Editors) **Environment and Planning: Volume B: Planning and Design**, Sage, London, v-xxvi.
- (with Elden, S., Thrift, N., Barnes, T. J., Peck, J., Longley, P. A. and Bennett, R. J. Introduction: Foundations, in Elden, S., Thrift, N., Barnes, T. J., Peck, J., Batty, M., Longley, P. A. and Bennet, R. J. (Editors) **Environment and Planning: Volume E: Foundations**, Sage, London, vii-xv.
- (with Timmermans, H., Couclelis, H. and Wegener, M.) LUMOS-models from an international perspective, in Koomen, E. and Borsboom-van Beurden, J. (Editors) **Land-Use Modelling in Planning Practice**, Springer, Berlin, pp. 23-34.
- Dynamics of Land-Use Change and Growth, in D. Robinson (Editor) **Computer Modelling for Sustainable Urban Design: Physical Principles, Methods and Applications**, Earthscan, London, 237-258.
- 2010 (with Besussi, E., Chin, N., and Longley, P.) The Structure and Form of Urban Settlements, in T. Rashed and C. Jürgens (Editors) **Remote Sensing of Urban and Suburban Areas**, DOI 10.1007/978-1-4020-4385-7_2, Springer Science+Business Media B.V., The Netherlands, 13-31
- Complexity in City Systems: Understanding, Evolution, and Design, in G. de Roo and E. A. Silva (Editors) **A Planner's Encounter with Complexity**, Ashgate Publishers Ltd, Farnham, UK, 99-121
- 2009 (Dawson, R., Hall, J., Barr, S., Bristow, A., Carney, S., Dagoumas, A, Evans, S., Ford, A., Harwatt, H., Kohler, J., Tight, M., Walsh, C., And Zanni, A.) A Blueprint for the Integrated Assessment of Climate Change in Cities, in K. Tang (Ed) **Green CITYnomics: The Urban War against Climate Change**, Greenleaf Publishing, Chippenham, UK, 32-51.
- Generating Cities from the Bottom Up: Using Complexity Theory for Effective Design, in K. Alexiou, J. Johnson, and T. Zamenopoulos (Editors) **Embracing Complexity in Design**, Routledge, London, 1-18.
- (with Benguigui, L., and Blumenfeld-Lieberthal, E.) Macro and Micro Dynamics of the City-Size Distribution: The Case of Israel, in A. Reggiani and P. Nijkamp (Editors), **Complexity and Spatial Networks: In Search of Simplicity**, Advances in Spatial Science, Springer-Verlag, Heidelberg, DE, 33-49.

- Urban Modeling, in R. Kitchin and N. Thrift (Eds) **International Encyclopedia of Human Geography**, Volume 12, Elsevier, Oxford, 51-58.
- (with Carvalho, R.) Citation Geography, in R. Kitchin and N. Thrift (Eds) **International Encyclopedia of Human Geography**, Volume 2, Elsevier, Oxford, 97-106.
- Cities as Complex Systems: Scaling, Interactions, Networks, Dynamics and Urban Morphologies, In R. Meyers (Editor) **Encyclopedia of Complexity and Systems Science**, Volume 1, pp 1041-1071, Springer, Berlin, DE.
- (with Lin, H.) Virtual Geographic Environments: A Primer, in H. Lin and M. Batty (Editors) **Virtual Geographic Environments**, Science Press, Beijing, China, 1-13.
- 城市系统的复杂性与凸现及其在城市规划中的意义, in 詹庆明 (Editors) **城市规划中的空间地理信息与决策支持**, 武汉大学出版社
- Evolving Real and Ideal City Form using Complexity Theory: A New Paradigm for Planning, in E. Stolk and M. te Broemelstroet (Editors) **Model Town: Using Urban Simulation in New Town Planning**, International New Town Institute, Uitgeverij SUN, Amsterdam, 57-71.
- Intelligent Cities, Virtual Cities, In Gary Hack, G., Birch, E. L., Sedway, P. H., and Mitchell J. Silver, M. J. (Editors) **Local Planning: Contemporary Principles and Practice**, IMCA Press, Washington, DC, 408-412.
- 2008 (with Hudson-Smith, A., Milton, R., and Dearden, J.) The Neogeography of Virtual Cities: Digital Mirrors into a Recursive World, in M. Foth (Editor), **Handbook of Research on Urban Informatics: The Practice and Promise of the Real-Time City**, Information Science Reference, IGI Global, Hershey, PA, 270-290.
- Planning Support Systems: Progress, Predictions, and Speculations on the Shape of Things to Come, in R. K. Brail (Editor) **Planning Support Systems for Cities and Regions**, Lincoln Institute of Land Policy, Cambridge, MA, 3-30.
- Virtual Reality in Geographic Information Systems, in J. P. Wilson and A. S. Fotheringham (Editors) **The Handbook of Geographic Information Science**, Blackwell Publishing, Oxford, UK, 317-334.
- Diffusion, in K. K. Kemp (Editor) **International Encyclopedia of Geographic Information Science**, Sage. Los Angeles, CA, 102-104.
- Spatial Interaction, in K. K. Kemp (Editor) **International Encyclopedia of Geographic Information Science**, Sage. Los Angeles, CA, 416-418.
- Fifty Years of Urban Modelling: Macro Statics to Micro Dynamics, in S. Albeverio, D. Andrey, P. Giordano, and A. Vancheri (Editors) **The Dynamics of Complex Urban Systems: An Interdisciplinary Approach**, Physica-Verlag, Heidelberg, DE, 1-20.
- Hierarchy, Scale, and Complexity in Urban Design, in T. Haas (Editor) **T. Haas (Editor) New Urbanism and Beyond: Designing Cities for the Future**, Rizzoli, New York, 258-261.
- 2007 (with K. Piyathamrongchai) Integrating Cellular Automata and Regional Dynamics Using GIS, in E. Koomen, J. Stillwell, A. Bakema, and H. Scholten (Editors) **Modelling Land-Use Change**, Springer, Dordrecht, Netherlands, 259-277.
- (with Hudson-Smith, A) Imagining the Recursive City: Explorations in Urban Simulacra, in H. J. Miller (Editor) **Societies and Cities in the Age of Instant Access**, Springer, Dordrecht, Netherlands, 39-55.
- 2006 (with Barros, J., and Junior, S. A.) Cities: Continuity, Transformation and Emergence, In E. Garnsey and J. McGlade (Editors) **Complexity and Co-Evolution: Continuity and Change in Socio-Economic Systems**, Edward Elgar, Cheltenham UK, pp. 61-76.
- Information Technology, in Ian Douglas, Richard Huggett, and Chris Perkins (Editors) **Companion Encyclopedia of Geography: From Local to Global**, Routledge, London, pp. 245-264.
- (with Besussi, E., Chin, N., and Longley, P.) The Structure and Form of Urban Settlements, in Rashed, T. and Juergens, C. (Eds) **Remote Sensing of Urban and Suburban Areas**, Springer, Berlin and New York (in press).
- Virtual London, in Heywood, I., Cornelius, S., and Carver, S. **An Introduction to Geographical Information Systems**, Pearson Educational, Harlow, UK, pp. 269-

271.
 (with Steadman, P. and Xie, Y.) Visualization in Spatial Modeling, in J. Portugali (Editor) **Complex Artificial Environments**, Springer, Berlin, 49-70.
 Hierarchy in Cities and City Systems, in D. Pumain (Editor) **Hierarchy in the Natural and Social Sciences**, Springer, Dordrecht, Netherlands, 143-168.
- 2005 Agent-Based Technologies and GIS: Simulating Crowding, Panic, and Disaster Management, in S. Rana and J. Sharma (Editors) **Frontiers of Geographic Information Technology**, Springer, Berlin, 81-101.
 (with Hudson-Smith, A., and Evans, S.) Virtual London: From CAD to 3D-GIS to Global Digital Cities, in M-L. Chiu (Editor) **Insights of Digital Cities**, Archdata CAAD Talks 4, Taipei, Taiwan, 75-92.
 (with Barros, J. and Sinesio-Alves, J.) The Dynamics of Cities, in A. Bruzzo and S. Occelli (Editors) **Le Relazioni Tra Conoscenza Ed Innovazione Nello Sviluppo Dei Territori**, Franco Angeli, Milan, 371-385.
 Network Geography: Relations, Interactions, Scaling and Spatial Processes in GIS, in P. F. Fisher, and D. Unwin (Editors) **Re-presenting GIS**, John Wiley, Chichester, UK, 149-169.
 GIS, Spatial Analysis, and Modeling: Current Status and Future Prospects, in D. J., Maguire, M. Batty and M. F. Goodchild (Editors) **GIS, Spatial Analysis, and Modeling**, ESRI Press, Redlands, CA, 445-455.
 (With Y. Xie) Urban Growth using Cellular Automata Models, in D. J., Maguire, M. Batty and M. F. Goodchild (Editors) **GIS, Spatial Analysis, and Modeling**, ESRI Press, Redlands, CA, 151-172.
 Approaches to Modeling in GIS: Spatial Representation and Temporal Dynamics, in D. J., Maguire, M. Batty and M. F. Goodchild (Editors) **GIS, Spatial Analysis, and Modeling**, ESRI Press, Redlands, CA, 41-61.
 (with Y. Xie) Integrated Urban Evolutionary Modeling, in P. M. Atkinson, G. M. Foody, S. E. Darby, and F. Wu (Editors) **Geodynamics**, CRC Press, Boca Raton, FL, 273-293.
 (with A. Hudson-Smith, S. Evans, and S. Batty) Community Participation in Urban Regeneration using Internet Technologies, in Julian Hunt (Editor) **London's Environment: Prospects for a Sustainable World City**, Imperial College Press, London, 221-240.
- 2004 (with Carvalho, R.) Automatic Extraction of Hierarchical Urban Networks: A Micro-Spatial Approach, in **Computational Science - ICCS 2004**, 4th International Conference, Part III, Springer, Berlin, 1109-1116.
 (with Shiode N., Li C., Longley, P. A., and Maguire, D.) The Impact and Penetration of Location-Based Services, in H. Karma and A. Hammad (Editors), **Telegeoinformatics: Location Based Computing and Services**, CRC Press, Boca Raton, FL, 349-66.
- 2003 (with Longley, P. A.) Epilogue: Researching the Future of GIScience, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 427-435.
 (with Longley, P. A.) Prologue: Advanced Spatial Analysis: Extending GIS, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 1-17.
 (with Longley, P. A., Boulton, C., and Greatbatch, I.) Strategies for Integrated Retail Management Using GIS, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 211-231.
 (with Hudson-Smith, A., Evans, S., and Batty, S.) Experiments in Web-Based GIS, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 369-390.
 (with Shiode, N.) Population Growth Dynamics in Cities, Countries and Communication Systems, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 327-343.
 Agent-Based Pedestrian Models, in P. A. Longley and M. Batty (Editors) **Advanced Spatial Analysis: The CASA Book of GIS**, ESRI Press, Redlands, CA, 81-106.
 New Developments in Urban Modelling: Simulation, Representation, and Visualization, in S. Guhathakurta (Editor), **Integrated Land Use &**

- Environmental Models**, Springer-Verlag, Berlin, 13-43.
Using Geographical Information Systems, in N. J. Clifford and G. Valentine (Editors) **Key Methods in Geography**, Sage, London, Chapter 23, 409-423.
Spatial and Locational Modelling in Human Geography, in A. Rodgers and H. A. Viles (Editors) **The Student's Companion to Geography**, Blackwell Publishing, Oxford, UK, 157-160.
- 2001 Virtual Reality, Virtual Cities, and the Built Environment, in N. Saito (Editor) **Creative Digital Media: Its Impact on the New Century**, Keio Research Institute, Keio University, Tokyo, Japan, 203-210.
(with M. Thurstain-Goodwin) The Sustainable Town Centre, in A. Layard, S. Davoudi, and S. Batty (Editors) **Planning for a Sustainable Future**, Routledge/Spon, London, 253-268.
(with Chapman, D., Evans, S., Haklay, M., Kueppers, S., Shiode, N., Smith, A., and Torrens, P. Visualizing the City: Communicating Urban Design to Planners and Decision-Makers, in R. Brail and R. Klosterman (Editors) **Planning Support Systems: Integrating Geographic Information Systems, Models, and Visualization Tools**, ESRI Press, Redlands, CA, 405-443.
Cellular Dynamics: Modelling Urban Growth as a Spatial Epidemic, in M. Fischer and Y. Leung (Editors) **GeoComputational Modelling: Techniques and Application**, Springer-Verlag, Berlin, 109-141.
(with A. Smith) Virtuality and Cities: Definitions, Geographies, Designs, in P. F. Fisher, and D. B. Unwin (Editors) **Virtual Reality in Geography**, Taylor and Francis, 270-291.
(with David Howes) Predicting Temporal Pattern, in J. P. Donnay, M. Barnsley and P. A. Longley (Editors), **Urban Development from Remote Imagery, in Remote Sensing and Urban Analysis**, Taylor and Francis, London, 185-204.
- 2000 (with Harvey J. Miller) Representing and Visualizing Physical, Virtual and Hybrid Information Spaces, in D. G. Janelle et al. (Editors) **Information, Place, and Cyberspace**, Springer-Verlag, New York, 133-146.
(with B. Jiang) Multi-Agent Simulation: Computational Space-Time Dynamics in GIS, in P. Atkinson and D. Martin (Editors) **Innovations in GIS VII: GIS and Geocomputation**, Taylor and Francis, London, 55-71.
Geocomputation Using Cellular Automata, in S. Openshaw and B. Abrahart (Editors) **Geocomputation** Taylor and Francis, London, 95-126.
- 1999 (with M. Dodge, B. Jiang and A. Smith) Geographical Information Systems and Urban Design, in J. Stillwell, S. Geertman, and S. Openshaw (editors) **Geographical Information and Planning**, Springer, Heidelberg, Germany, 43-65.
New Technology and GIS, in P. A. Longley, M. F. Goodchild, D. J. Maguire, and D. W. Rhind (Editors) **Geographical Information Systems: Principles and Technical Issues: Volume 1** John Wiley and Sons, New York, 309-316.
- 1998 (with M. Dodge, S. Doyle, and A. Smith) Modelling Virtual Environments, in P. A. Longley, S. Brooks, R. McDonnell, and B. Macmillan (Editors) **Geocomputation: A Primer**, John Wiley and Sons, Chichester, UK, 139-161.
Evaluation in the Digital Age, in N. Lichfield, A. Barbanente, D. Borri, A. Khakee, and A. Prat (Editors) **Evaluation in Planning: Facing the Challenge of Complexity** Kluwer, Dordrecht, The Netherlands, 251-272.
- 1996 (with P. Longley) Fractal Models of Urban Structure, in E. Besussi, and A. Cecchini (Editors) **Artificial Worlds and Urban Studies**, DAEST, Conveni. n.1, Venezia, Italia, 207-216.
(with P. Longley) Analytical GIS: The Future, in P. A. Longley and M. Batty (Editors) **Spatial Analysis: GIS in a Modelling Environment**, Geoinformation International, Cambridge, UK, 345-352.
Visualizing Urban Dynamics, in P. A. Longley and M. Batty (Editors) **Spatial Analysis: GIS in a Modelling Environment**, Geoinformation International, Cambridge, UK, 297-320.
(with T. V. Mesev and P. Longley) RS-GIS: Spatial Distributions from Remote Imagery, in P. A. Longley and M. Batty (Editors) **Spatial Analysis: GIS in a Modelling Environment**, Geoinformation International, Cambridge, UK, 123-148.
(with P. Longley) Analysis, Modelling, Forecasting and GIS Technology, in P. A.

- Longley and M. Batty (Editors) **Spatial Analysis: GIS in a Modelling Environment**, Geoinformation International, Cambridge, UK, 1-15.
 (with D. Howes) Exploring Urban Development Dynamics through Visualisation and Animation, in D. Parker (Editor) **Innovations in GIS 3**, Taylor and Francis, London, 143-155.
- 1995 (with T. V. Mesev, P. A. Longley, and Y. Xie) Fractal Measurement of a Classified Image: The Case of Bristol, England, in M. M. Fischer, S. T. Tamas, and B. Laszlo (Editors) **Recent Developments in Spatial Information, Modelling and Processing**, Geomarket Company, Budapest, Hungary, 107-122.
 Geographic Information Systems in the Social and Policy Sciences, in M. Eagles (Editor) **Spatial and Contextual Models of Political Research**, Taylor and Francis, London, 14-40.
 Cities and Complexity: Implications for Modeling Sustainability, in J. Brotchie, M. Batty, E. Blakely, P. Hall, and P. Newton (Editors) **Cities in Competition: Productive and Sustainable Cities for the 21st Century**, Longman Australia, Melbourne, London and New York, 469-486.
- 1994 (with Y. Xie) Urban Analysis in a GIS Environment: Population Density Modeling Using ARC/INFO, in A. S. Fotheringham and P. A. Rogerson (Editors) **Spatial Analysis and GIS**, Taylor and Francis, London, 189-219.
- 1993 (with P. Longley) Speculations on Fractal Geometry in Spatial Dynamics, in P. Nijkamp and A. Reggiani (Editors) **Nonlinear Evolution of Spatial Economic Systems**, Springer-Verlag, Berlin, 203-222
 (with A. S. Fotheringham, and P. Longley) Fractal Geometry and Urban Morphology, in N. S-N. Lam and L. De Cola (Editors) **Fractals in Geography**, Prentice Hall, Englewood Cliffs, NJ, 228-246.
 Using Geographic Information Systems in Urban Planning and Policy-Making, in M. M. Fischer and P. Nijkamp (Editors) **Geographic Information Systems, Spatial Modelling, and Policy Evaluation**, Springer-Verlag, Berlin and New York, 51-69.
- 1992 Geographic Information Systems: GIS in Urban Planning and Policy Analysis, in H. Sazanami (Editor) **GIS in Regional Development Planning**, Proceedings of the Study Group Meeting on Regional and Global Economic Integration, Development Planning, and Information Technology, United Nations Centre for Regional Development, Nagoya, Japan, 27-60.
- 1991 Urban Information Networks: The Evolution and Planning of Computer-Communications Infrastructure, in J. Brotchie, M. Batty, P. Hall, and P. Newton (Editors) **Cities of the 21st Century: New Technologies and Spatial Systems**, Longmans, London and Halsted Press, New York, 139-157.
 (with P. Longley and A. S. Fotheringham) The Geometry of Urban Form and the Fractal Nature of Urban Growth, in D. Pumain (Editor) **Spatial Analysis and Population Dynamics**, John Libbey, Montrouge, 175-185.
 Cities as Fractals: Simulating Growth and Form, in T. Crilly, R. A. Earnshaw, and H. Jones (Editors) **Fractals and Chaos**, Springer-Verlag, New York, 41-69.
- 1990 Informative Planning: The Intelligent Use of Information Systems in the Policy-Making Process, in H. Sazanami (Editor) **Critical Success Factors: Key to Use of Information Systems/Technology in Local/Regional Planning**, United Nations Centre for Regional Development, Nagoya, Japan, 307-356.
- 1989 Urban Modelling and Planning, in B. MacMillan (Editor) **Remodelling Geography** (Ed. B. Macmillan, Basil Blackwell, Oxford, UK, 147-169.
 (with P. Longley) Measuring and Simulating the Structure and Form of Cartographic Lines, in J. Hauer, H. Timmermans, and N. Wrigley (Editors) **Urban Dynamics and Choice Behaviour**, Kluwer, Dordrecht, The Netherlands, 269-292.
- 1988 Educating Planners in Information Technology: Experiences from Developed and Developing Countries, in H. Sazanami (Editor) **Information Systems for Government and Business: Trends, Issues and Challenges**, United Nations Centre for Regional Development, Nagoya, Japan, 317-362.
 Home Computers and Regional Development : An Exploratory Analysis of the Spatial Market for Home Computers in Britain, in. Giaoutzi and P. Nijkamp (Editors) **Informatics and Regional Development**, Avebury-Gower Publishing

- Company, Aldershot, Hampshire, 147-165.
- 1987 The Spatial Impact of Computer Culture : Post-Industrialism and the Spread of the Personal Computer in Britain, in J. F. Brotchie, P. Hall and P. Newton (Editors) **The Spatial Impact of Technological Change**, Croom Helm, London, 185-208.
- 1986 Technical Issues in Urban Model Development : A Review of Linear and Non-Linear Model Structures, in B. G. Hutchinson and M. Batty (Editors) **Advances in Urban Systems Modelling**, North Holland Publishing Company, Amsterdam, 133-162.
- 1985 Formal Reasoning in Urban Planning, in M. Breheny and A. Hooper (Editors) **Rationality In Planning**, Pion, London, 98-119.
Industrial Futures: UK, in J. Brotchie, P. Newton, P. Hall and P. Nijkamp (Editors) **The Future of Urban Form**, Croom Helm, London, 41-53.
- 1984 Urban Development as Exchange, in A. Andersson, W. Isard, and T. Puu (Editors) **Regional and Industrial Development Theories, Models and Empirical Evidence**, North Holland Publishing Company, Amsterdam, The Netherlands, 309-329.
- 1982 (with R. S. Spooner) Attitudes towards Urban Systems Analysis: A Survey of Participants, in M. Batty and B. G. Hutchinson (Editors) **Systems Analysis in Urban Policy-Making and Planning**, Plenum Press, New York, 567-581.
On Systems Theory and Analysis in Urban Planning, in M. Batty and B. G. Hutchinson (Editors) **Systems Analysis in Urban Policy-Making and Planning**, Plenum Press, New York, 423-447.
- 1981 Urban Models, in N. Wrigley and R. Bennett (Editors) **Quantitative Geography in Britain: Retrospect and Prospect**, Routledge and Kegan Paul, London, 181-191.
- 1980 Logical Problems concerning the Use of Models in Strategic Planning, in M. Pfaff and W. Assam (Editors) **Integrierte Infrastrukturplanung zur Verbesserung der Lebensbedingungen in Stadten und Gemeiden**, Duncker and Humblot, Berlin, 83-103.
- 1979 On Planning Processes, in B. G. Goodall and A. M. Kirby (Editors) **Resources and Planning**, Pergamon Press, Oxford, 17-45.
- 1978 (with L. March) Urban Models based on Information-Minimising, in R. L. Martin, R. J. Bennett and N. J. Thrift (Editors) **Towards Dynamic Analysis of Spatial Systems** (Eds., Pion Press, London, 127-155.
Operational Urban Models incorporating Statics in a Dynamic Framework, in A. Karlqvist, L. Lunqvist, F. Snickars and J. W. Weibull (Editors) **Spatial Interaction Theory and Planning Models**, North Holland Publishing Company, Amsterdam, 227-252.
Urban Models in the Planning Process, in D. T. Herbert and R. J. Johnston (Editors) **Geography and the Urban Environment: Volume 1: Progress in Research and Applications**, John Wiley and Sons, London, 63-134.
Speculations on an Information Theoretic Approach to Spatial Representation, in I. Masser & P. J. B. Brown (Editors) **Spatial Interaction and Spatial Representation**, Martinus Nijhoff Social Sciences Division, Leiden and Boston, 115-147.
- 1976 Jungste Entwicklungen in de Modellkonstruktion fur Bodennutzung, in W. Schraeder and M. Sauberer (Editors) **Methoden Der Empirischen Raumforschung**, Institut fur Raumplanung, Universitat Dortmund, Dortmund, 275-322.
- 1975 Recent Developments in Activity Allocation Models in a British Context, in R. Baxter, M. Echenique, and J. Owers (Editors) **Urban Development Models**, The Construction Press, Lancaster, UK, 30-40.
- 1973 The Use of Models in British Planning: Applications in the Central Berkshire Subregion, in J. Perraton and R. Baxter (Editors) **Models, Systems and Evaluations for Planners**, The Construction Press, Lancaster, UK, 79-94.
System Modelling and Planning, in J. Perraton and R. Baxter (Editors) **Models, Systems and Evaluations for Planners**, The Construction Press, Lancaster, UK, 18-30.

Journal Articles

- 2013 (with Masucci, A. P., Serras, J., and Johansson, A.) Gravity versus Radiation Models: On the Importance of Scale and Heterogeneity in Commuting Flows, **Physical Review E** **88**, 022812 (2013)
- (with Masucci, A. P., and Stanilov, K.) Limited Urban Growth: London's Street Network Dynamics from the 18th Century, **PLoS ONE** **8** (8): e69469. doi:10.1371/journal.pone.0069469
- (with O'Brien, O., and Cheshire, J.) Mining Bicycle Sharing Data for Generating Insights in Sustainable Transport Systems, **Journal of Transport Geography**, in press.
- Big Data, Smart Cities, and City Planning, **Dialogues in Human Geography**, in press
- A Theory of City Size (Perspectives), **Science**, **340** no. 6139, 1418-1419
- Visually-Driven Urban Simulation: Exploring Fast and Slow Change in Residential Location, **Environment and Planning A**, **45**, 532 - 552.
- (with Mohajeri, N., French J. R.) Evolution And Entropy In The Organization Of Urban Street Patterns, **Annals of GIS**, **19**, 1-16.
- 2012 (with Carbone, A., M. Ajmone-Marsan, M., K.W. Axhausen, K. W., Masera, M., and Rome, E.) Complexity-Aided Design: The FuturICT Technological Innovation Paradigm, **European Physical Journal Special Topics**, **214**, 435-459
- (with K. Axhausen, G. Fosca, A. Pozdnoukhov, A. Bazzani, M. Wachowicz, G. Ouzounis, and Y. Portugali) Smart Cities of the Future, **European Physical Journal Special Topics**, **214**, 481-518.
- (with M. Cristelli, and L. Pietronero) There is More than a Power Law in Zipf, **Scientific Reports**, 6th November, 2012, at www.nature.com/srep/
- (with C. Roth, S. M. Kang, and M. Barthelemy) A Long-Time Limit for World Subway Networks, **Journal of the Royal Society Interface**, published online 16 May 2012; doi: 10.1098/rsif.2012.0259
- Urban Regeneration as Self-Organisation, **Architectural Design**, **215**, 54-59
- Building a Science of Cities, **Cities**, **29**, S9-S16
- (with Johansson, A, Hayashi, K., Al Bar, O., Marcozzi, D., and Memish, Z. A.) Crowd and Environmental Management During Mass Gatherings, **The Lancet Infectious Diseases**, doi:10.1016/S1473-3099(11)70287.
- 2011 (with Cao, K., Huang, B., Liu, Y., Yu, L., and Chen, J.) Spatial Multi-Objective Land Use Optimization: Extensions to the Non-Dominated Sorting Genetic Algorithm-II, **International Journal of Geographical Information Science**, <http://dx.doi.org/10.1080/13658816.2011.570269>, on-line preprint.
- (with Mavrogianni, A., Davies, M., Belcher, S E ,Bohnenstengel, S I , Carruthers, D., Chalabi, Z., Croxford, B.,Demanelle, C., Evans, S., Giridharan, R., Hacker, J. N., Hamilton, I., Hogg, C., Hunt, J., Kolokotroni, M., Martin, C., Milner, J., Rajapaksha, I., Ridley, I., Steadman, J. P., Stocker, J., Wilkinson, P., and Ye, Z.) The Comfort, Energy and Health Implications of London's Urban Heat Island, **Building Services and Engineering Research Technology**, **32**, 35-52.
- Modelling and Simulation in Geographic Information Science, **Procedia Social and Behavioral Sciences** **21**, 10-17.
- (with Stanilov, K.) Exploring the Historical Determinants of Urban Growth Patterns through Cellular Automata, **Transactions in GIS**, **15**(3), 253-271
- Commentary: When all the World's a City, **Environment and Planning A** **43**(4) 765-772
- (with Walsh, C. L., Dawson, R. J., Hall, J. W., Barr, S. L., Batty, M., Bristow, A. L., Carney, S., Dagoumas, A. S., Ford, A. C., Harpham, C., Tight, M. R., Watters, H., and Zanni, A. M.) (2011) Assessment of Climate Change Mitigation and Adaptation in Cities, **Urban Design and Planning** (Proceedings ICE), **164**, 2, 75-84.
- (with Roth C., Kang S. M., and Barthelemy, M., Structure of Urban Movements: Polycentric Activity and Entangled Hierarchical Flows. **PLoS ONE** **6**(1): e15923. doi:10.1371/journal.pone.0015923
- (with Bentley, R. A., and Ormerod, P.) Evolving Social Influence in Large

- 2010 Populations, **Behavioral Ecology and Sociobiology**, **65**, 537-546
 (with Hudson-Smith, A., Milton, R. and Crooks, A.) Map Mashups, Web 2.0 and the GIS Revolution, **Annals of GIS**, **16**(1), 1 - 13.
 Visualising Space-Time Dynamics in Scaling Systems, **Complexity**, **16**, 2, 51-63.
 Space, Scale, and Scaling in Entropy-Maximising, **Geographical Analysis**, **42**, 4, 395-421.
- 2009 (with Marshall, S.) The Evolution of Cities: Geddes, Abercrombie and the New Physicalism, **Town Planning Review**, **80** (6), 551-574.
 (with Richards, K., Edwards, K., Findlay, A., Foody, G. Frostick, L., Jones, K., Lee, R., Livingstone, D., Marsden, T., Petts, J., Philo, C., Simon, D., Smith, S., Thomas, D.) (2009) The Nature of Publishing and Assessment in Geography and Environmental Studies: Evidence from the Research Assessment Exercise 2008, **Area**, **41**, 3, 231-243.
 (with Hudson-Smith, A., Crooks, A., Gibin, M., and Milton, R.) NeoGeography and Web 2.0: Concepts, Tools and Applications, **Journal of Location Based Services**, **3**, 118-145
 (with Steadman, P., and Evans, S.) Wall Area, Volume and Plan Depth in the Building Stock, **Building Research and Information**, **37**(5-6), 455-467.
 (with Masuccia, A. P., Smith, D. and Crooks, A.) Random Planar Graphs and the London Street Network, **The European Physical Journal B**, **71**, 259-271.
 (with Hudson-Smith, A., Crooks, A., and Milton, R.) Mapping for the Masses: Accessing Web 2.0 Through Crowdsourcing, **Social Science Computer Review**, **27**, 4, 524-538.
 A Digital Breeder for Generating Cities, **Architectural Design**, **79**, 4, July-August, Profile No 200, 46-49.
- 2008 (with Rozenfeld, H. D., Rybski, D., Andrade, J. S., Stanley, H. E., and Makse, H. A.) Laws of Population Growth, **Proceedings of the National Academy of Sciences**, **105** (48), 18702-18707.
 (with A. Crooks and C. Castle) Key Challenges in Agent-Based Modelling for Geo-Spatial Simulation, **Computers, Environment, and Urban Systems**, **32** (6), 417-430.
 (with Collins, S. L., Suding, K. N., Cleland, E. E., Pennings, S. C., Gross, K.L., Grace, J. B., Gough, L. Fargione, J. E. and Clark, C. M.) Rank Clocks and Plant Community Dynamics, **Ecology**, **89**(12), 3534-3541.
 (with Carvalho, R., Hudson-Smith, A., Milton, R., Duncan Smith, D., and Steadman, P.) Scaling and Allometry in the Building Geometries of Greater London, **European Physical Journal B**, **63**, 303-318.
 The Size, Scale, and Shape of Cities, **Science**, **319**, (5864, 8 February), 769 - 771.
- 2007 Model Cities, **Town Planning Review**, **78** (2) 125-151.
 (with Xie, Y. and Zhao, K.) Simulating Emergent Urban Form Using Agent-Based Modeling: Desakota in the Suzhou-Wuxian Region in China, **Annals of the Association of American Geographers**, **97**(3), 477-495.
- 2006 Rank Clocks, **Nature**, **444**, 592-596.
 (with Carvalho, R.) The Geography of Scientific Productivity: Scaling in US Computer Science, **Journal of Statistical Mechanics**, **10**, P10012, 1-11.
- 2005 (with Hudson-Smith, A.) Urban Simulacra: From Real to Virtual Cities, Back and Beyond, **Architectural Design**, **75** (6), 42-47.
 (with de Almeida, C.M., Monteiro, A. M. V., Câmara, G., Soares-Filho, B, S., Cerqueira, G. C., and Pennachin, C. L.) GIS and Remote Sensing as Tools for The Simulation of Urban Land-Use Change, **International Journal of Remote Sensing**, **26**, (4), 759 - 774.
 Agents, Cells, and Cities: New Representational Models for Simulating Multiscale Urban Dynamics, **Environment and Planning A**, **37** (8), 1373 - 1394.
 (with Hudson-Smith, A., and Evans, S.) Building the Virtual City: Public Participation Through e-Democracy, **Knowledge Technology and Policy**, **18**, 62-85.
 (with Carvalho, R.) Encoding Geometric Information in Road Networks Extracted from Binary Images, **Environment and Planning B**, **32**, 179-190.
 (with Torrens, P. M.) Modelling and Prediction in a Complex World, **Futures**, **37**

- (7), 745-766.
- 2004 (with Besussi, E., Maat, K., and Harts, J. J.) Representing Multifunctional Cities: Density and Diversity in Space and Time, **Built Environment**, **30**, (4). 324-337.
 (with Rana, S.) The Automatic Definition and Generation of Axial Lines and Axial Maps, **Environment and Planning B**, **31**, 615-640.
 (with Rana, S.) Visualising the Structure of Architectural Open Spaces based on Shape Analysis, **International Journal of Architectural Computing**, **2**, 123-132.
- 2003 (with Desyllas, J., and Duxbury, E.) The Discrete Dynamics of Small-Scale Spatial Events: Agent-Based Models of Mobility in Carnivals and Street Parades, **International Journal of Geographic Information Science**, **17**, 673-697.
 (with Desyllas, J., and Duxbury, E.) Safety in Numbers? Modelling Crowds and Designing Control for the Notting Hill Carnival, **Urban Studies**, **40**, 1573-1590
 (with de Almeida, Câmara1, G., Cerqueira, G. C., Monteiro, A. M. V., Pennachin, C. P., and Soares-Filho, B. S.) Stochastic Cellular Automata Modeling of Urban Land Use Dynamics: Empirical Development and Estimation, **Computers, Environment, and Urban Systems**, **27**, 481-509.
- 2001 Models in Planning: Technological Imperatives and Changing Roles, **International Journal of Applied Earth Observations and Geoinformation**, **3**, 252-266.
 Polynucleated Urban Landscapes, **Urban Studies**, **38**, 4, 635 - 655.
 Exploring Isovist Fields: Space and Shape in Architectural and Urban Morphology, **Environment and Planning B**, **28**, 123-150.
- 1999 (with Y. Xie) Self-Organized Criticality and Urban Development, **Discrete Dynamics in Nature and Society**, **3**, 109-124.
 (with Xie, Y., and Sun, Z) Modeling Urban Dynamics Through GIS-Based Cellular Automata, **Computers, Environments and Urban Systems**, **23**, 205-233.
 (with Jiang, B., and Claramunt, C) Geometric Accessibility and Geographic Information: Extending Desktop GIS to Space Syntax, **Computers, Environments and Urban Systems**, **23**, 127-146.
- 1998 (with H. A. Makse, J. S. Andrade Jr., S. Havlin, and H. E. Stanley) Modeling Urban Growth Patterns with Correlated Percolation, **Physical Review E**, **58**, 6, 7054-7062.
 Urban Evolution on the Desktop: Simulation Using Extended Cellular Automata, **Environment and Planning A**, **30**, 1943-1967.
- 1997 Growing Cities, **Las Ciudades Inasibles**, **5**, 4-53.
 (with P. Longley) The Fractal City, **Architectural Design**, **67** (9-10: Profile 129), 74-83.
 The Computable City, **International Planning Studies**, **2**, 155-173.
 Virtual Geography, **Futures**, **29**, 337-352.
 (with S. Cole) Time and Space: Geographic Perspectives on the Future, **Futures**, **29**, 277-289.
 (with Y. Xie) Automata-Based Exploration of Emergent Urban Form, **Geographical Systems**, **4**, 83-102.
 Cellular Automata and Urban Form: A Primer, **Journal of the American Planning Association**, **63**, 266-274.
- 1996 (with Y. Xie) Possible Urban Automata, **Environment and Planning B**, **24**, 175-192; also in E. Besussi, and A. Cecchini (Editors) **Artificial Worlds and Urban Studies**, DAEST, Conveni. n.1, Venezia, Italia, 1996, 177-205.
 (with P. Densham) Decision Support, GIS, and Urban Planning, **Sistema Terra**, **5**, 72-76.
 (with Y. Xie) Preliminary Evidence for a Theory of the Fractal City, **Environment and Planning A**, **28**, 1745-1762.
- 1995 Planning Support Systems and the New Logic of Computation, **Regional Development Dialogue**, **16**, 1-17.
 (with V. Mesev, P. Longley and Y. Xie) Morphology from Imagery: Detecting and Measuring the Density of Urban Land Use, **Environment and Planning A**, **27**, 759-780.
- 1994 (with Y. Xie) From Cells to Cities, **Environment and Planning B**, **21**, s31-s48.
 (with B. Barr) The Electronic Frontier: Exploring and Mapping Cyberspace,

- Futures**, **26**, 699-712.
 (with Y. Xie) Modeling Inside GIS: Part 2: Selecting and Calibrating Urban Models Using ARC-INFO, **International Journal of Geographical Information Systems**, **8**, 451-470.
 (with Y. Xie) Modeling Inside GIS: Part 1: Model Structures, Exploratory Spatial Data Analysis, and Aggregation, **International Journal of Geographical Information Systems**, **8**, 291-307.
 A Chronicle of Scientific Planning: The Anglo-American Modeling Experience, **Journal of the American Planning Association**, **59**, 7-16.
- 1993 (with B. Harris) Locational Models, Geographic Information and Planning Support Systems, **Journal of Planning Research and Education**, **12**, 184-198; reprinted in R. Brail and R. Klosterman (Editors) **Planning Support Systems: Integrating Geographic Information Systems, Models, and Visualization Tools**, ESRI Press, Redlands, CA, 2001, 25-57.
- 1992 Urban Modeling in Computer-Graphic and Geographic Information System Environments, **Environment and Planning B**, **19**, 663-685.
 (with K. S. Kim) Form Follows Function: Reformulating Urban Population Density Functions, **Urban Studies**, **29**, 1043-1070.
 (with P. Longley, J. Shepherd, and G. Sadler) Do Green Belts Change the Shape of Urban Areas: A Preliminary Analysis of the Settlement Geography of South East England, **Regional Studies**, **26**, 437-452.
- 1991 New Technology and Planning: Reflections on Rapid Change and the Culture of Planning in the Post-Industrial Age, **Town Planning Review**, **62**, 269-294.
 Generating Urban Forms from Diffusive Growth, **Environment and Planning A**, **23**, 511-544.
 (with P. Longley and J. Shepherd) The Size, Shape and Dimension of Urban Settlements, **Transactions of the Institute of British Geographers**, **16**, 75-94.
- 1989 (with A. S. Fotheringham and P. A. Longley) Diffusion-Limited Aggregation and the Fractal Nature of Urban Growth, **Papers of the Regional Science Association**, **67**, 55-69.
 (with P. Longley and A. S. Fotheringham) Urban Growth and Form, **Environment and Planning A**, **21**, 1447-1472.
 (with P. Longley) On the Fractal Measurement of Geographical Boundaries, **Geographical Analysis**, **21**, 47-67.
 Geography and the New Geometry, **Geography Review**, **2**, 7-10.
 (with P. Longley) Fractal Measurement and Line Generalisation, **Computers and GeoSciences**, **15**, 167-183.
- 1988 (with J. D. Alden, S. Batty, and P. Longley) An Economic and Social Profile of the Cardiff Bay Area, **Cambria**, **15**, 61-87.
 (with P. Longley) The Morphology of Urban Land Use, **Environment and Planning B**, **15**, 461-488.
- 1987 (with P. Longley) Using Fractal Geometry to Measure Maps and Simulate Cities, **Computer Education**, **56**, 15-19.
 (with P. Longley) Urban Shapes as Fractals, **Area**, **19**, 215-221.
 (with P. Longley) Fractal Description of Urban Form, **Environment and Planning B**, **14**, 123-134.
- 1986 (with P. Longley) The Fractal Simulation of Urban Structure, **Environment and Planning A**, **18**, 1143-1179.
- 1985 Questa Montagna Che Non Finisce Mai, **Genius**, **10**, Luglio, 26-34.
 Fractals: Geometry between Dimensions, **New Scientist**, **105**, 1450, 31-35.
 (with I. Bracken, C. Guy and R. Spooner), Teaching Spatial Modelling Using Interacting Computers and Interactive Computer Graphics, **Journal of Geography in Higher Education**, **9**, 25-36.
- 1984 Plan Design and Committee Decision-Making, **Environment and Planning B**, **11**, 279-295.
 (with P. K. Sikdar) Proximate Aggregation-Estimation of Spatial Interaction Models, **Environment and Planning A**, **16**, 467-486.
- 1983 The Crisis in Planning Education, **The Planner**, **69**, 127-129.

- Linear Urban Models, **Papers of the Regional Science Association**, **53**, 5-25.
 (with Karmeshu) A Strategy for Generating and Testing Models of Migration and Urban Growth, **Regional Studies**, **17**, 223-226.
- 1982 Cost, Accessibility and Weighted Entropy, **Geographical Analysis**, **15**, 256-267.
 The Quest for the Qualitative: New Directions in Planning Theory and Analysis, **Urban Policy and Research**, **1**, 15-23.
 Planning Systems and Systems Planning, **Built Environment Quarterly**, **8**, 252-257.
 (with R. S. Spooner) Models of Attitudes towards Urban Modelling, **Environment and Planning B**, **9**, 41-64.
 (with P. K. Sikdar) Spatial Aggregation in Gravity Models: 4 Generalisation and Large-Scale Applications, **Environment and Planning A**, **14**, 795-822.
 (with P. K. Sikdar) Spatial Aggregation in Gravity Models: 3 Two-Dimensional Trip Distribution and Location Models, **Environment and Planning A**, **14**, 629-658.
 (with P. K. Sikdar) Spatial Aggregation in Gravity Models: 2 One-Dimensional Population Density Models, **Environment and Planning A**, **14**, 525-553.
 (with P. K. Sikdar) Spatial Aggregation in Gravity Models: 1 An Information-Theoretic Framework, **Environment and Planning A**, **14**, 377-405.
 Research for Planning, **The Planner**, **68**, 38-41.
- 1981 Symmetry and Reversibility in Social Exchange, **Journal of Mathematical Sociology**, **9**, 1-41.
 (with R. S. Spooner) Networks of Urban Systems Analysis, **Environment and Planning B**, **8**, 449-475.
- 1980 Limits to Prediction in Science and Design Science, **Design Studies**, **1**, 153-159.
- 1979 Progress, Success and Failure in Urban Modelling, **Environment and Planning A**, **11**, 863-878.
 Paradoxes of Science in Public Policy: The Baffling Case of Land Use Models, **Sistemi Urbani**, **1**, 89-122.
 Invariant-Distributional Regularities and the Markov Property in Urban Models: An Extension of Schinnar's Result, **Environment and Planning A**, **11**, 487-497.
 (with R. Sammons) A Conjecture on the Use of Shannon's Formula for Measuring Spatial Information, **Geographical Analysis**, **11**, 304-310.
 (with K. J. Tinkler) Symmetric Structure in Spatial and Social Processes, **Environment and Planning B**, **6**, 3-27.
 Efficient Calibration of Urban Models with Dynamic Solution Properties, **London Papers in Regional Science**, **9**, 26-63.
- 1978 (with R. Sammons) On Searching for the Most Informative Spatial Pattern, **Environment and Planning A**, **10**, 747-779.
 Ten Years of Urban Modelling in Britain, **Area**, **10**, 111-115.
 Reilly's Challenge: New Laws of Retail Gravitation which define Systems of Central Places, **Environment and Planning A**, **10**, 185-219.
- 1977 Modelle, Methoden und Rationalitat in der Stadtund Regional Planung: die Entwicklung seit 1960, **AMR Info**, **4**, 3-16.
- 1976 Entropy in Spatial Aggregation, **Geographical Analysis**, **8**, 1-21.
 (with L. March) The Method of Residues in Urban Modelling, **Environment and Planning A**, **8**, 189-214.
 Models, Methods and Rationality in Urban and Regional Planning: Developments since 1960, **Area**, **8**, 93-97.
- 1975 Design as Collective Action, **Environment and Planning B**, **2**, 151-176.
 Generating Plans for Urban Growth: Some Related Design Methods, **Contact**, **7**, 1-6.
 (with L. March) Generalised Measures of Information, Bayes' Likelihood Ratio and Jaynes' Formalism, **Environment and Planning B**, **2**, 99-105.
 (with I. Masser) Spatial Decompositions and Partitions in Urban Modelling, **London Papers in Regional Science**, **5**, 188-206.
 In Defence of Urban Modelling, **The Planner**, **61**, 184-187.
- 1974 Computer Models in Structure Planning, **Town and Country Planning**, **423**, 453-457.

- Urban Density and Entropy Functions, **Journal of Cybernetics**, **4**, 41-55.
 (with P. Hall and D. N. M. Starkie) The Impact of Fares-Free Public Transport upon Urban Land Use and Activity Patterns, **Transportation Research Forum**, **15**, 347-353.
 A Theory of Markovian Design Machines, **Environment and Planning B**, **1**, 125-146.
 (with R. Bourke et al) Experiments in Urban Modelling for County Structure Planning: The Area 8 Pilot Model, **Environment and Planning A**, **6**, 455-478.
 Social Power in Plan Generation, **Town Planning Review**, **45**, 291-310.
 Spatial Entropy, **Geographical Analysis**, **6**, 1-31.
- 1973 A Probability Model of the Housing Market based on Quasi-Classical Considerations, **Socio-Economic Planning Sciences**, **7**, 573-598.
 (with D. Foot et al) Spatial System Design and Fast Calibration of Activity-Interaction Allocation Models, **Regional Studies**, **7**, 351-366.
 (with S. Mackie) Auto-Calibration of Trip-Distribution Models, **Traffic Engineering and Control**, **14**, 468-471.
- 1972 Entropy and Spatial Geometry, **Area**, **4**, 230-236.
 Dynamic Simulation of an Urban System, **London Papers in Regional Science**, **3**, 44-82.
 (with S. Mackie) The Calibration of Gravity, Entropy and Related Models of Spatial Interaction, **Environment and Planning**, **4**, 205-233.
 (with A. Saether) A Note on the Design of Shopping Models, **Journal of the Royal Town Planning Institute**, **58**, 303-306.
 Recent Developments in Land Use Modelling: A Review of British Research, **Urban Studies**, **9**, 151-177.
- 1971 An Experimental Model of Urban Dynamics, **Town Planning Review**, **43**, 166-186.
 Design and Construction of a Subregional Land Use Model, **Socio-Economic Planning Sciences**, **5**, 97-124.
 Exploratory Calibration of a Retail Location Model using Search by Golden Section, **Environment and Planning**, **3**, 411-432.
 Modelling Cities as Dynamic Systems, **Nature**, **231**, 425-428.
 An Approach to Rational Design: Part 2: Design Problems as Markov Chains, **Architectural Design**, **41**, 498-501.
 An Approach to Rational Design: Part 1: The Structure of Design Problems, **Architectural Design**, **41**, 436-439.
 An Activity Allocation Model for the Nottinghamshire-Derbyshire Subregion, **Regional Studies**, **4**, 307-322.
- 1970 Some Problems of Calibrating the Lowry Model, **Environment and Planning**, **2**, 95-114.
 Models and Projections of the Space-Economy: A Subregional Study in North West England, **Town Planning Review**, **41**, 121-147.
- 1969 The Impact of a New Town, **Journal of the Town Planning Institute**, **55**, 428-435.

Commentaries in Journals and Books

- 2013 Foreword: The Inextricable Duality of Cities and Planning, in Shih-Kung Lai and Haoying Han (2012) **Urban Complexity and Planning: Computer Simulations**, Ashgate Publishing, London
- 2011 Foreword, in Koomen, E. and Borsboom-van Beurden, J. (Editors) **Land-Use Modelling in Planning Practice**, Springer, Berlin, pp. v-vii.
- 2010 Foreword, in Danielle J. Marceau and Itzhak Benenson (Editors) **Advanced Geosimulation Models**, Benthan Science Publishers, online, forthcoming.
- 2008 Preface, to **Landscape Analysis and Visualisation: Place and Purpose: Spatial Models for Natural Resource Management and Planning**, edited by Christopher Pettit, William Cartwright, Ian Bishop, Kim Lowell, David Pullar, and David Duncan, Springer, Berlin, DE, v-viii.
- 2006 Foreword, in Wang, F., **Quantitative Methods and Applications in GIS**, CRC Press, Boca Raton, FL, i-ii.

- 2006 Preface: Geomatics in Urban and Regional Planning - Challenges and Perspectives, Almeida, C. M., Camara, G., and Monteiro, A. M. V. (Editors) **Geoinformação em Urbanismo: Cidade Real x Cidade Virtual**. 1. ed. São Paulo, Brazil, Editora Oficina de Textos, pp. 5-7.
- 2004 Contributions to Part 4: Looking To The Future, in I. Gilfoyle and P. Thorpe, **Geographic Information Management in Local Government**, CRC Press, Boca Raton, FL, 205-212.
Michael Batty on 'Wilson's Entropy in Urban and Regional Modelling', **Papers in Regional Science**, **83**, 74-76.
- 2003 *Opinion*: Citation Geography: It's About Location, **The Scientist**, 17 (16), August 25th, 1-4.
Commentary: The Geography of Scientific Citation, **Environment and Planning A**, **35**, 761- 765.
- 2002 Preface: Planning Support Systems: Technologies that are Driving Planning, in S. Geertman and J. Stillwell (Editors) **Planning Support Systems in Practice**, Springer, Berlin, Germany, v-viii.
- 2001 Forward, in N. J. Tate and P. M. Atkinson (Editors) **Modelling Scale in Geographical Information Science**, John Wiley and Sons, Chichester, UK, ix-xii.
Forward: Digital Paradigms: Planning in an Information Age, in R. Laurini, **Information Systems for Urban Planning**, Taylor and Francis, London, ix-xiii.
Virtual Reality, Spatial Analysis, and the Performance of the Built Environment, **Building Performance**, **3**, 24-30.
- 1998 From *Environment and Planning B to Planning and Design*: traditions, transitions, translations, and transformations, **Environment and Planning B**, **25**, Anniversary Issue, 1-9.
- 1997 Predicting Where We Walk, **Nature**, **388**, 19-20.
- 1995 New Ways of Looking at Cities, **Nature**, **377**, 574.
Editorial Introduction: Urban Planning and Planning Support Systems, **Regional Development Dialogue**, **16**, v-xiii.
Comment on Delafons, **Town Planning Review**, **66**, 95-97.
- 1991 (with A. Hay and A. G. Wilson) Classics in Human Geography Revisited: A Statistical Theory of Spatial Distribution Models, **Progress in Human Geography**, **15** 433-436.
(with Tony Yeh), Guest Editorial: The Promise of Expert Systems for Urban Planning, **Computers, Environments and Urban Systems**, **15**, 101-108.
- 1990 (with Tony Yeh), Guest Editorial: Applications of Geographic Information Systems to Urban and Regional Planning, **Environment and Planning B**, **17**, 369-374.
Comment on Harris: Planning Support Systems and the Emerging Technological Environment for Urban and Regional Planning, **Regional Development Dialogue**, **11**, 58-62.
- 1989 Desktop Planning: A Review Article, **Town Planning Review**, **60**, 461-464.
- 1988 (with S. A. Matthews), Relationships between Teaching and Research, **Area**, **20**, 158-162.
Impressions of Japan and the Emergence of Post-Industrial Society, **Journal of the Japan Society of Civil Engineers**, **73**, 16-19.
- 1984 Urban Policies in the 1980's: A Review of the OECD Proposals for Managing Urban Change, **Town Planning Review**, **55**, 489-498.
- 1979 The Search for Spatial Truth, **Progress in Human Geography**, **3**, 159-166.
- 1974 A Comment on "A Comparison of the Kullback and Shannon Measures of Information" by Hobson and Cheng, **Journal of Statistical Physics**, **11**, 523-524.

Editorials: Environment and Planning B

- 2013 Resilient Cities, Networks, and Disruption, **Environment and Planning B**, **40**, 571-573.
The Database of Intentions, **Environment and Planning B**, **40**, 381-383.
The Future Cities Agenda, **Environment and Planning B**, **40**, 191-194.
Defining Geodesign (= GIS + design ?), **Environment and Planning B**, **40**, 1-2.
- 2012 The 22nd Century City, **Environment and Planning B**, **39**, 972 - 974.

- Managing Complexity, Reworking Prediction, **Environment and Planning B**, **39**, 607 - 608.
 (With J. Cheshire) Visualisation Tools for Understanding Big Data, **Environment and Planning B**, **39**, 413 - 415.
- 2011 Smart Cities, Big Data, **Environment and Planning B**, **39**, 191 - 193.
 Infinite Repercussions, **Environment and Planning B**, **38**, 943 - 944.
 Defining City Size, **Environment and Planning B**, **38**, 753 - 756. (With P. Ferguson)
 Cities, Prosperity and the Importance of Being Large, **Environment and Planning B**, **38**, 385-387.
 (With J. Cheshire) Cities as Flows, Cities of Flows, **Environment and Planning B**, **38**, 195-196.
- 2010 Randomness, cities, and urban order, **Environment and Planning B**, **38**, 1-2.
 The Unpredictability of the Near and Far Future, **Environment and Planning B**, **37**, 958-960.
 A Changing Picture of Cities and Their Planning, **Environment and Planning B**, **37**, 767 - 768.
 The Pulse of the City, **Environment and Planning B**, **37**, 577-579.
 Very Complex Systems, Very Hard Problems, **Environment and Planning B**, **37**, 385-386.
 When the Web Is Woven, **Environment and Planning B**, **37**, 195-196.
 As Simple as Possible: Styles of Model, Styles of Science, **Environment and Planning B**, **37**, 1-2.
- 2009 Darwin at 200 and the Evolution of Planning, **Environment and Planning B**, **36**, 951-952.
 Defining Density, **Environment and Planning B**, **36**, 571-572.
 Catastrophic Cascades: Extending our Understanding of Urban Change and Dynamics, **Environment and Planning B**, **36**, 381-383.
 Accessibility: In Search of a Unified Theory, **Environment and Planning B**, **36**, 191-194.
- 2008 The Dilemmas of Physical Planning, **Environment and Planning B**, **35**, 760-761.
 Whither Network Science?, **Environment and Planning B**, **35**, 569 - 571.
 Discontinuities, Tipping Points, and Singularities: The Quest for a New Social Dynamics, **Environment and Planning B**, **35**, 379 - 380
 Generative Social Science: A Challenge, **Environment and Planning B**, **35**, 191-194.
 How Tall Can We Go? How Compact Can We Get? The Real Questions Of Urban Sustainability, **Environment and Planning B**, **35**, 1-2.
- 2007 The Real-time Academy: Anyplace, Anywhere, Anytime, **Environment and Planning B**, **34**, 947-948.
- 2006 The Creative Destruction of Cities, **Environment and Planning B**, **34**, 1-4.
 (with A. Hudson-Smith) Digital Cornucopias: Changing Conceptions of the Virtual City, **Environment and Planning B**, **33**, 799-802.
 Public Sector Information: Chains of Added Value, **Environment and Planning B**, **33**, 163-164.
 Icons of the Early 21st Century: 2. Security and Surveillance, **Environment and Planning B**, **33**, 1-2.
- 2005 Icons of the Early 21st Century: 1. Storage and Search, **Environment and Planning B**, **32**, 161-162.
- 2004 Faster or Complex? A Calculus for Urban Connectivity, **Environment and Planning B**, **31**, 803-804.
 The Coming Oil Crisis, **Environment and Planning B**, **31**, 645-646.
 Dissecting the Streams of Planning History: Technology Versus Policy Through Models, **Environment and Planning B**, **31**, 326-330.
- 2003 Unwired Cities, **Environment and Planning B**, **30**, 797-798.
 The Next Big Thing: Surveillance from the Ground Up, **Environment and Planning B**, **30**, 325-326.
 World Class Universities, World Class Research: What Does It All Mean? **Environment and Planning B**, **30**, 1-2.
- 2002 The Erosion of the Intellectual Commons, **Environment and Planning B**, **29**, 793-

794.
Urban Bubbles, **Environment and Planning B**, **29**, 635-636.
- 2001 Thinking about Cities as Spatial Events, **Environment and Planning B**, **29**, 1-2.
Cities as Small Worlds, **Environment and Planning B**, **28**, 637-638.
Contradictions and Conceptions of the Digital City, **Environment and Planning B**, **28**, 479-480.
- 2000 Agent-Based Pedestrian Modeling, **Environment and Planning B**, **28**, 321-326.
"A Slow Sort of Country" said the Queen!, **Environment and Planning B**, **27**, 799-800.
The New Geography of the Third Dimension, **Environment and Planning B**, **27**, 483-484.
Less is More, More is Different: Complexity, Morphology, Cities, and Emergence, **Environment and Planning B**, **27**, 167-168.
- 1999 Small Worlds and Large Webs: The Power of Scale, **Environment and Planning B**, **26**, 791-792.
Contemporary Planning: The Limits of First-Order Thinking, **Environment and Planning B**, **26**, 636-638.
A Research Programme for Urban Morphology, **Environment and Planning B**, **26**, 475-476.
- 1998 The Journal: The Future, **Environment and Planning B**, **25**, 793-794.
- 1997 Assessing the Quality of Research, **Environment and Planning B**, **25**, 163-166.
- 1996 Urban Systems as Cellular Automata, **Environment and Planning B**, **24**, 159-164.
The Retail Revolution, **Environment and Planning B**, **24**, 1-2.
- 1995 Urban Change, **Environment and Planning B**, **23**, 513-514.
Simulating Reality, **Environment and Planning B**, **23**, 253-254.
Planning, Late 20th Century-Style, **Environment and Planning B**, **23**, 1-2.
- 1994 Cities, Planning, Design, Computation, and Evolution, **Environment and Planning B**, **22**, 379-382.
- 1993 On Building Ideas, **Environment and Planning B**, **21**, s1-s3.
The World Wide Web, **Environment and Planning B**, **21**, 651-652.
Urban Models 25 years On, **Environment and Planning B**, **21**, 515-516.
The Job Market for PhDs, **Environment and Planning B**, **21**, 257-258.
- 1992 The Geography of Cyberspace, **Environment and Planning B**, **20**, 615-616.
On the Electronic Frontier: Building the Information Highway, **Environment and Planning B**, **20**, 123-124.
- 1991 Visual Economics, **Environment and Planning B**, **19**, 489-492.
Only Twelve Aspiring World Class Universities in Britain? **Environment and Planning B**, **19**, 241-242.
Mirror Worlds: From Infrastructure to Infostructure, **Environment and Planning B**, **19**, 121-124.
- 1990 Strengthening the Journal, **Environment and Planning B**, **18**, 379, 1991
Computers and Planning: Old Ideas, New Tools, **Environment and Planning B**, **18**, 135-137.
- 1989 Intelligent Cities: Using Information Networks to Gain Competitive Advantage, **Environment and Planning B**, **17**, 247-256.
Invisible Cities, **Environment and Planning B**, **17**, 127-130.
How Can We Best Respond to Changing Fashions in Urban and Regional Planning, **Environment and Planning B**, **17**, 1-7.
- 1988 Experiment and Prediction in Urban Systems: Reassessing the Methods of Contemporary Research, **Environment and Planning B**, **16**, 367-370.
The Link to Education, **Environment and Planning B**, **16**, 251-252.
Changing the Way We Think about Planning and Design, **Environment and Planning B**, **16**, 119-126.
Planning in the Third World, **Environment and Planning B**, **16**, 1-6.
- 1987 The Cult of Information, **Environment and Planning B**, **15**, 375-382.
The Crisis in British Universities, **Environment and Planning B**, **15**, 1-4.
- 1986 Models in Planning: Where Do We Go from Here ?, **Environment and Planning B**, **14**, 119-122.

- The Rise and Fall of Town and Country Planning 1948-1984, **Environment and Planning B**, 14, 1-3.
- 1986 **Environment and Planning B**, 13, 253-254.
Academe and the Commercial World, **Environment and Planning B**, 13, 1-3.
- 1984 **Environment and Planning B**, 11, 363-364.
- 1983 A Plan for Planning Education, **Environment and Planning B**, 10, 245-248.
- 1982 **Environment and Planning B**, 9, 239-240.
Environment and Planning B, 9, 1-4.

Reports

- 2010 (with Anand, S., Crooks, A., Hudson-Smith, A., Jackson, M., Milton, R., & Morley, J. (2010) Data Mash-Ups and the Future of Mapping, **TechWatch Horizon Scanning Report**, JISC, at <http://www.jisc.ac.uk/whatwedo/services/techwatch/reports/horizonscanning/hs1001.aspx>
- 2002 M. Thurstain-Goodwin, M. Batty, Muki Haklay, D. Lloyd, R. Boott, A. Hyman, S. Batty, C. Tomalin, C. Cadell, N. Falk, S. Sheppard, and S. Curtis, **Producing Boundaries and Statistics for Town Centres**, The Stationary Office, London, 71 pages + CD-ROM.
- 1999 **Evaluation of the ESRC-JISC 1991 Census of Population Programme**, Policy and Evaluation Division, ESRC, Swindon, UK.
- 1998 (with H. W. Reinhardt et al.) **Quality Assessment of Research: Architecture, Building, and Planning**, VSNU (Association of Universities in the Netherlands), Utrecht, The Netherlands.
(with M. Thurstain-Goodwin et al. for DETR) **Town Centres: Defining Boundaries for Statistical Monitoring: Feasibility Study**, The Stationary Office, London.
- 1988 (with J. Alden, S. Batty, and P. Longley) **A Socio-Economic Profile of Cardiff Bay**, Wales and South West Regional Research Laboratory, University of Wales College of Cardiff, Cardiff.
- 1977 (with C. Buchanan and Partners) **Midden Randstadt**, Final Report, Colin Buchanan and Partners, London.
- 1975 (with Suthill, F., et al) **The Reading-Wokingham-Basingstoke-Aldershot Subregional Study**, Berkshire County Council, Reading.
- 1968 (with Thorburn, A. et al) **Nottinghamshire-Derbyshire Subregional Study**, Derbyshire C. C. and Nottinghamshire C.C. Planning Departments, Alfreton, Derbyshire.

Book Reviews

I have reviewed a number of books in the following journals: these are undated: **Annals of AAG** (1), **Annals of Regional Science** (1), **Applied Mathematical Modelling** (5), **Building Research and Information** (1), **Design** (1), **Design Studies** (5), **Environment and Planning A** (21), **Environment and Planning B** (10), **Environment and Planning C** (1), **Futures** (2), **Geographical Analysis** (1), **Geographical Magazine** (1), **GIS Europe** (2), **Habitat** (1), **Habitat International** (1), **International Journal of Urban and Regional Research** (1), **International Journal of Geographic Information Science** (1), **International Planning Studies** (1), **Journal of the American Planning Association** (1), **Journal of Urban Design** (1), **Journal of Regional Science** (3), **Journal of the Royal Town Planning Institute: The Planner** (14), **Mapping Awareness** (1), **Nature** (1), **Papers in Regional Science** (1), **The Photogrammetric Record** (2), **Planning Newspaper** (3), **Population Studies** (1), **Progress in Human Geography** (5), **Sociology** (1), **Regional Studies** (12), **The Times Higher Education Supplement** (3), **Town Planning Review** (6), **Transport Reviews** (1), **Transportation** (1), **Urban Design International** (1) and **Urban Studies** (8)

PhD Thesis Pseudo Dynamic Urban Models (PhD University of Wales, 1984), xiii + 448 pp., NCB85-19527, University Microfilms International, Ann Arbor, MI 48106

Working Papers and Conference Proceedings

Since 1999, CASA working papers are located at <http://www.casa.ucl.ac.uk/publications/>

- 2009 Notes on Accessibility: In Search of Unified Theory, in **Proceedings of the 7th International Space Syntax Symposium**, edited by Lars Marcus et al., KTH, Stockholm, Sweden, June 2009, Invited Paper, 52-56
- 2007 (with R. Carvalho, A. Hudson-Smith, R. Milton, D. Smith, and P. Steadman) Geometric Scaling and Allometry in Large Cities, in **Proceedings of the 6th International Space Syntax Symposium**, edited by A. Kubat, O.Ertekin, Y. Guney, and E. Eyuboglu, Volume 1, ITU, Istanbul, June 2007, Keynote V.
- 2006 Innovations in Virtual Cities: New Software, New Data, New Media, in P. S. Ruiz (Editor) **NuPolis2006**, Universidad de Chile, Santiago, Chile, 46-49.
Visualizing the City, in P. S. Ruiz (Editor) **SiGraDi2006: Proceedings of the X Congreso Iberoamericano de Grafica Digital**, Universidad de Chile, 23-26.
- 2004 Large Scale Disasters in Small Scale Spaces: Simulating Crowd Movements, Congestion, and Panic, in **Proceedings of the Ninth International Seminar on GIS: Emergency and Disaster Response with GIS**, Korean Research Institute for Human Settlements, September 8-9, 2004, 1-25.
- 2003 (with E. Besussi and N. Chin) Traffic, Urban Growth and Suburban Sprawl, Mobility for All (Mobilidade para Todos), **Simposio Internacional ACP**, FIA Foundation Lisboa, Portugal, 59-71
- 1998 Information Technology and the Future City: Speculations and Implications for Arriyadh, **MEDSTAR Phase 2 Working Paper**, available from CASA, UCL, or MEDSTAR, Arriyadh Development Authority, Arriyadh, Saudia Arabia.
- 1997 Digital Planning: Preparing for a Fully Wired World, in **Computers in Urban Planning and Urban Management: Keynote Papers**, edited by P. K. Sikdar, S. L. Dhingra, and K. V. Krishna Rao, Narosa Publishing House, Delhi, India, 13-30.
- 1995 (with C. J. Cote, D. Howes. P. Pelligrini and X. Zheng) Data Requirements for Land Use Modeling: First Thoughts and a Preliminary Assessment, in G. Schunk, P. L. Bass, C. A. Weatherby and L. J. Engelke (Editors) **Land Use Modeling Conference Proceedings**, February 19-21, 1995, Travel Model Improvement Program, US Department of Transportation, Washington DC 20590, 41-64.
(with D. F. Marble and A. G. Yeh) **Training Manual on Geographic Information Systems in Local/Regional Planning**, UNCRD Textbook Series No. 3, United Nations Centre for Regional Development, Nagoya, Japan, 259 pp. + xii
- 1992 Sharing Information in Third World Planning Agencies: Perspectives on the Impact of GIS, **NCGIA Technical Report 92-8**, University of California, Santa Barbara, CA.
Land Use and Transportation Planning for Urban Development Zones, in **Proceedings, International Symposium on Urban and Zonal Planning for Metropolitan Areas**, The Shanghai Peoples' Municipal Government, Shanghai, PRC and United Nations UN-DTCD), New York.
- 1991 Creating Visual Environments for Simulating Urban Spatial Structure: The Buffalo Model, in **Proceedings, Second International Conference on Computers in Urban Planning and Urban Management**, Oxford, UK, 1991
Information for Planning and Decision Making, **A Paper for the UNESCO Meeting of Experts**, Beijing, China, 10-14 December 1990, UNESCO, Paris, PGI-90/CONF.601/2, 51 pp.
- 1990 Information Systems for Planning in Developing Countries, in **Information Systems and Technology for Urban and Regional Planning in Developing Countries: A Review of UNCRD's Research Project**, Volume 2, United Nations Centre for Regional Development, Nagoya, Japan, 105-236.
- 1989 Cities as Information Networks, **Technical Report 15**, Wales and South West Regional Research Laboratory, Cardiff, 28 pp.
- 1988 Informative Planning : The Intelligent Use of Information Systems in the Policy-Making Process, **Technical Report 10**, Wales and South West Regional Research Laboratory, Cardiff, 76 pp.

- Incidences des Mutations Technologiques, Sociales et Economiques sur la Politique Urbaines, **Developpement Urbain et Impacts sur le Milieu Urbain du Changement Technologique, Economique et Socio-Demographique**, OCDE, Paris, 8-22
- 1987 Urban Modelling and Planning: Reflections, Retrodictions and Prescriptions, **Working Paper No. 25**, University of Hong Kong Centre for Urban Studies and Urban Planning, Hong Kong, 43 pp.
Urban Policy Impacts of Technological, Social and Economic Change, **A Report for the OECD Group on Urban Affairs**, OECD, Paris, 64 pp.
- 1984 Information Technology in Planning Education, **Papers in Planning Research, 80**, UWIST Department of Town Planning, Cardiff, 50 pp.
- 1980 Computers and Design, **Papers in Planning Research, 2**, UWIST Department of Town Planning, Cardiff, 27 pp.
- 1977 Structural Models of the Physical Plan-Making Process, in **Policy Analysis for Urban and Regional Planning: Proceedings of the Fourth Annual Meeting of PTRC Seminar B: PTRC**, London, 1-14.
- 1976 **A Political Theory of Planning and Design**, Geographical Paper No. 45, Department of Geography, University of Reading, Reading, 65 pp.
- 1975 (with L. March) **Information-Minimizing Formalism and the Derivation of Non-Parametric Forms for Population and Transportation Models**, Report No. 8-S-240775, Department of Systems Design, University of Waterloo, Ontario, 39 pp.
Speculations on Models, Methods and Machines for the Design of Physical Plans, in A. Feo (Editor) **Proceedings of the Second Annual Conference on Models in Architecture and Planning**, UMUA, Central University, Caracas, 1-42.
- 1974 **Plan Generation**, Geographical Paper No. 25, Department of Geography, University of Reading, Reading, 37 pp.
- 1973 The Science and Art of Urban Modelling, **Proceedings of the Symposium of Studies on Urban and Regional Systems**, University of Calabria, Cosenza, Italy, 21-39.
Design as a Markov Process, in **Proceedings of the Third International Conference on Design: Theme 2, Design Processes, Techniques and Algorithms**, Design Research Society, UK and Design Methods Group USA, London, 2/2/1-2/2/9.
Planning in an Age of Crisis, in W. Zwirner and P. Healey (Editors) **Ideologies in Planning**, Working Paper 2, Planning Workshop, Kingston Polytechnic, 37-55.
- 1972 **An Educational Computer Program for Land Use Allocation Modelling**, Geographical Paper No. 17, Department of Geography, University of Reading, Reading, 24 pp.
An Introspective but Scientific Approach to Plan-Design and Evaluation, in **Proceedings of the Oxford Conference on Evaluation in Planning**, Oxford Polytechnic, School of Town Planning, Oxford, 1-27.
(with S. Mackie) Some Problems in Calibrating Many Parameter Trip-Distribution and Trip-Location Models, **Proceedings of the PTRC Seminar on Urban Traffic Models**, PTRC, London, 32 pp.
- 1971 A Review of Methods for Calibrating the Garin-Lowry Model, in **Seminar on an Urban Development Model**, CES Conference Paper, Centre for Environmental Studies, London, 37-81.
- 1970 **Introductory Model-Building Problems for Urban and Regional Planning**, Urban Systems Research Unit, University of Reading, Reading, 42pp.
Spatial Theory and Information Systems, Urban Systems Research Unit, Working Paper No. 3., University of Reading, Reading, 42pp.
- 1969 A Review of the Theory Pertaining to Spatial Organisation, in I. Masser (Editor) **The Use of Models in Planning**, Department of Civic Design, University of Liverpool, Liverpool, 1-27.
Design Methods in Spatial Planning: Some Suggestions, Department of Town and Country Planning, University of Manchester, Manchester, 21 pp.
The Garin-Lowry Model: Papers on an Application to North-East Lancashire, Department of Town and Country Planning, University of Manchester, 65 pp.

Miscellaneous Publications

- 2013 Agents, Models and Geodesign, *ArcNews*, Esri, Spring 2013, Vol. 35, No. 1 available at <http://www.esri.com/esri-news/arcnews/spring13articles/agents-models-and-geodesign>
Big Data: Big Issues, *Geographical Magazine of the Royal Geographical Society*, January, 75
- 2010 Integrated Models and Grand Challenges, *ArcNews*, Winter 2010/2011, 32, no 4, available at <http://www.esri.com/esri-news/arcnews>
Networks, Flows, and Geometry in Cities: A Challenge to Space Syntax, *The Journal of Space Syntax (JOSS)*, 1, 2, 1-3, Online Publication Date: 17 December 2010 <http://www.journalofspacesyntax.org/>
All The World's A City, *Modus*, 11.10/12.10, RICS, 26-31
<http://www.rics.org/modus>
A Theory of e-Volution, *Public Service Review: Science and Technology*, Issue 8, online at <http://www.publicservice.co.uk/>
- 2009 (with Marshall, S.) From Darwinism to planning - through Geddes and back, *Town and Country Planning*, November, 462-464.
- 2008 Generating Cities from the Bottom Up: Using Complexity Theory for Effective Design, *Cluster*, 07, 150-161, www.cluster.eu/v2/themes/batty
- 2007 Organic Landscapes: Morphologies and Topologies in the Art of Anne Wilson, in Laurie Britton Newell (Editor) *Out of the Ordinary: Spectacular Craft*, V&A Publications and the Crafts Council, London, page 120.
- 2002 (with A. Hudson-Smith and S Evans) Homes in Hackney Point to the Future, *Planning*, 12 July, 14-15.
- 1998 (with N. Shiode, M. Dodge, B. Jiang, & M. Thurstain-Goodwin) The Centre for Advanced Spatial Analysis and Its Projects on Geographic Information Systems and Urban Analysis, *Theory & Applications of GIS*, 6, 81-86 (in Japanese).
- 1997 Day Trip to the 3rd Dimension, *GIS Europe*, 6 (10) October, 14-15.
- 1996 (with D. Howes) Visualizing Urban Development, *Geo Info Systems*, 6 (9), 28-32.
- 1994 Using GIS for Visual Simulation Modeling, *GIS World*, 7, (10), 46-48.
- 1992 (with Yichun Xie) NCGIA Researchers Interface Urban Models with ARC/INFO, *Arc News*, Fall, 14, 4, 18-19.
Physical Phenomena, *Geographical Magazine*, 64, No. 7, 35-37.
A Random Walk Along the Urban Boundary, *Geographical Magazine*, 64, 6, 34-36.
The Fractal Nature of Geography, *Geographical Magazine*, 64, No. 5, 32-36.
- 1990 How Planning Education Can Survive the Future: Thoughts about New Curricula, *Education for Planning Association Newsletter*, 19, 57-73.
- 1989 Technology Highs, *The Guardian*, Thursday, 22 June, 29.
- 1988 Software Making Sense of Chaos, *The Guardian*, Thursday, 14 April, 23.
- 1987 The Intelligent Plaza is only the Beginning, *The Guardian*, Thursday, 17 September, 19.
Don's Diary, *Times Higher Educational Supplement*, 30 January, 4.
(with P. Hills) Where Prices are a Steal, *The Guardian*, Thursday, 5 February, 13.
- 1986 Danger - Here be no Micros, *The Guardian*, Thursday, 25 May, 1986, p.16
- 1984 (with R. Spooner and I. Bracken) Computers in Planning Education: Development in Teaching and Research in the Department of Town Planning, UWIST, Cardiff, *BURISA Newsletter*, 65, 5-7
- 1983 A Change of Scene, *Acorn User*, 17, (December), 23-28.
On the Terrace, *Popular Computing Weekly*, 2, 45, 26-27.
Bubbling Under, *Popular Computing Weekly*, 2, 44, 26-27.
Scale and Perspective, *Popular Computing Weekly*, 2, 43, 21-22.
Flowering Art, *Popular Computing Weekly*, 2, 40, 29-31.
Rotating Ellipses, *Popular Computing Weekly*, 2, 39, 33-35.
Circular Logic, *Popular Computing Weekly*, 2, 38, 22-23.
Flying the Flag, *Popular Computing Weekly*, 2, 28, 26-27.
The Reskilling of Planning, *Education for Planning Association Newsletter*, 12, 3-

9.
1982 First Class Problem for Research Council, **Planning**, 418, 4.
1971 Teaching the Arts of Simulation, **Education for Planning Association Newsletter**, 1, 22-24.
Educational Model-Building, **Education for Planning Association Newsletter**, 1, 10-12.

18 August 2013