MARIAM KIRAN PhD MSc(Eng) FHEA MIET MBCS MACM

CONTACT INFORMATION

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EDUCATION

Sheffield University, Sheffield, UK

- PhD, Computer Science (Funded by Departmental Scholarship Scheme/EU FP6) **Jul 2010**
  Thesis Topic: *Investigating the co-evolutionary algorithms in Economic Agent-based Models*
  Supervisor: Professor Mike Holcombe
  Area of Study: Agent based modelling and computational economics
- MSc (Eng), Advanced Software Engineering **Sept 2006**
  Degree Classification: *Distinction*
  Thesis Topic: *Comparative Analysis of Hypercomputational Systems*
  Paper published: *Tale of the Oracle, Workshop of Hypercomputational models, Sheffield, UK*

Sheffield Hallam University, Sheffield, UK

- PgCert, Learning and Teaching in Higher Education **June 2009**

WORK EXPERIENCE

Lawrence Berkeley National Labs – ESNet, Berkeley, California
Research Scientist **June 2016 – Current**.

Bradford University – School of Computing Science, Bradford UK
Lecturer in Software Engineering and Cybersecurity **April 2014 – 2016**
Teaching postgraduate and undergraduate students. *Research*: Cloud computing, Smart City and Cybersecurity research bids. See section "Funding Track Record" for details.

Sheffield University – Department of Computer Science, Sheffield UK
Visiting Lecturer **March 2014 – Present**

Sheffield University – Department of Computer Science, Sheffield UK
Post Doctoral Research Fellow **2013 – March 2014**

Leeds University – School of Computing, Leeds UK
Post Doctoral Research Fellow **2011 – 2013**

Sheffield University – Department of Sociological Studies, Sheffield UK
Research Associate **2010**

Sheffield University – Department of Computer Science, Sheffield UK
Research Associate **2006 – 2010**

Other Research Project Affiliations

- **Simulation and Prediction in Crowded Environment (SPICE):** Funded by the competition of Ideas Grant by the Defence Science and Technology (DSTL) division of MOD. Designed and implemented agent based models ported on the Nvidia cards using FLAME. Designed models for predicting suicide bombers in market places. Also designed models for traffic modelling which later earned funding as a separate research project. Social behaviour modelling for predicting dangerous elements within the crowd with University of Birmingham, UK.
- **Flexible Large Agent-based Modelling Environment (FLAME):** FLAME is an EU and RC-UK funded tool (www.flame.ac.uk), developed into a professional tool for biologists and economists to use. Responsible for development of the agent-based modelling framework. Providing analysis, testing and deployment tools of the framework. Liaising with Rutherford Appleton Laboratories for parallel batch run testing of agents over parallel machines. Taught FLAME tutorials to MSc and PhD Students and supervised MSc dissertations.
- **European Agent-based Computational Economics (EURACE):** This involved research groups from seven universities from France, Italy, Turkey, Germany and UK to model and do

policy analysis of the economic world in the European Union, an EUFP6 project. My responsibilities included writing economic models of the labour and credit markets. Collecting simulation data for dissemination and analysis. Created a local hub for sharing EURACE files between research groups (www.eurace.groups.shef.ac.uk).

- **Automated Discovery of Emergent Misbehaviour (Misbehaviour):** Funded from EPSRC, involved developing methods for testing of agent-based models. My responsibilities included working with current researchers on the FLAME models for testing and working with genetic algorithms for testing of models. Presenting research work at conferences.
- **Modelling of the Epithelial cells and tissues (EPITHELIOME):** Funded from RC-UK for modelling epithelial skin cells for studying skin grafting techniques. My responsibilities included development of software tools for data analysis and measurement with agent-based models for cell structures. Implementing the model in parallel batch runs on the mainframe computer Iceberg on the White Rose consortium. Documentation of the software code.

INDUSTRY WORK EXPERIENCE (IN ADDITION TO WORKING WITH INDUSTRIES IN EU PROJECTS)

***EU project Advisor,* TelSec software solutions**, Reading, UK **2010-present**

- Managing EU project relations for Cloud security projects.

***Software Engineer,* Genesys software solutions**, Sheffield, UK **2006**

- Project manager for writing database applications. Worked in software teams to develop software tools for university.
- Responsible for documentation of source code. Packaging, delivering software.

***Software Engineer,* Smart Solutions**, Dubai, UAE **2005**

- Project manager for writing database apps. Packaging/delivering software.

OTHER TEACHING EXPERIENCE

Sheffield International College, Sheffield, UK
Part-time Teacher **2009 – 2010**

- Teaching Mathematics, Computer and Physics modules to international students.
- Physics lab monitoring. Exam invigilation and checking papers.
- Mentoring and pastoral care duties.

Department of Computer Science, Sheffield University, Sheffield, UK
Teaching Assistant **2007 – 2010**

- Teaching various modules to undergraduate and postgraduate students. Courses included Java, C, Agent-based modelling, software testing, teams in software huts, Natural systems modelling. Management of software teams as part of the Darwin and Genesys projects.
- Supervising MSc dissertations. Taught FLAME tutorial to MSc and PhD students.

FUNDING TRACK RECORD

Title/Scheme	**Funding body**	**Amount**
Reliability of Sensor Data and Business Cost models for IoT (PI)	Researcher in Residence Digital Catapult London	£ 25,000 Fellowship
Researchers in Westminster and Parliament Scheme (PI)	Royal Society London	Fellowship
ACM-W Inspire 2015 event (Chapter President)	ACM-W, Microsoft and Industry sponsors	£ 6000
Researcher Participation SDN workshop with ONUG group	NSF	$10,000
ICT COST Action IC1406 High-Performance Modelling and Simulation for Big Data Applications (cHiPSet) (Co-I)	EU Cost Action	10,000 euros
Business-Aware (Cost and Eco-Efficient) Big Data Management for Energy-usage Data over Cloud resources: A collaborative project with ESnet at LBNL	Visiting Research Grant, NEMODE (EPSRC)	£ 10,000
Find my Migraine (Co-I)	Sheffield Crucible Programme 2014	£10,000
Computer modelling of cancer resistance to chemotherapy (Co-I),	Sheffield Crucible Programme 2014	£10,000

Computer game for early detection of Parkinson's disease (Co-I)	Sheffield Crucible Programme 2014	£10,000
A Giant's bone: conveying scientific perspective of the human body to pre-school children (Co-I)	Sheffield Crucible Programme 2014	£10,000
Collaborative ethonography – Online resource pack for postgraduate students (Co-I)	Sheffield Methods Institute	£2000
Investigation Models of Bitcoin and its Risks" (PI)	NEMODE (EPSRC) Research Grant	£3000
Smart Citizen Engagement (Co-I)	ESRC	£50,000
Smart City Index (Co-I) (GSMA, Imperial College London, Sheffield University)	NEMODE (EPSRC) Research Grant	£10,000
Market Analysis for Smart City (Co-I) (GSMA, Sheffield University)	GSMA Industry Grant	£20,000
Paper Presented at AAMAS 2010, Toronto, Canada	Royal Academy of Engineering Travel grant	£1000
Fully Funded PhD Scholarship at Sheffield University	Distinction Scheme and EU project EURACE	PhD Scholarship

INVITED TALKS

- Dependency of Parallel Architectures for FLAME, Conference on Complex Systems, Phoenix, Arizona, 2015.
- Measuring the Smart City through an Index at the Mobile World Congress 2014, Barcelona.
- Research and academia in Building Smart cities, Intelligent Cities conference, Bradford 2014.
- Smart cities and role of Cloud, Vice chancellor talks Bradford 2015

PHD SUPERVISIONS

- Bashir Mohammad, Virtualisation and migration in Cloud computing environments
- Omololu Makinde, Data mining of Agent-based models
- Ashraf-Ul Oun, Handling and Management of Virtual Machines in Datacenter Network Using a Multi-Agent System

PROFESSIONAL MEMBERSHIPS AND OTHERS APPOINTMENTS

- Fellow of Higher Education.
- Member of British computing society.
- Member of IET.
- Member of ACM.
- STEM Ambassador for schools in Yorkshire.
- Member of Women in Engineering Society.
- Instigated the ACM-Women professional chapter for UK – Currently Chair (president)
- Member of Athena Swan representing post-docs and minority issues on the departmental boards at Sheffield.
- Member of ACM Student Bradford Chapter – Faculty sponsor.

AWARDS

- DOE Early Career Award
- Fretwell-Downing Prize for Best MSc Dissertation in Engineering, 2006.

PUBLICATIONS

Published Journal Articles:

- **M Kiran**, A Simons, Testing Software Services in Cloud Ecosystems, Int. Journal of Cloud computing IJCAC, accepted
- **M Kiran**, Modelling Cities as a Collection of TeraSystems–Computational Challenges in Multi-Agent Approach – Procedia Computer Science, 2015, Vol 52, 2015, pgs 974–979

- **M Kiran**, G Katsaros, J Guitart, JL Prieto, Methodology for Information Management and Data Assessment in Cloud Environments, International Journal of Grid and High Performance Computing (IJGHPC), 6(4), 46-71
- M.Holcombe, S.Coakley, **M. Kiran**, S.Chin, S.Cincotti, M.Raberto, A.Teglio, C.Deissenberg, S.vander Hoog, C.Greenough, H.Dawid, M.Neugart, S.Gemkow, P.Harting, D.Worth, EURACE consortium, Large-scale Modelling of Economic Systems, Complex Systems, 2014
- K.Djemame, B.Barnitzke, M.Corrales, **M. Kiran**, M.Jiang, D.Armstrong, N.Forgo, I.Nwankwo, Legal issues in clouds: towards a risk inventory, Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 2013, Vol 371, Issue 1983, The Royal Society
- M.Holcombe, S.Adra, M.Bicak, S.Chin, S.Coakley, A.I.Graham, J.Green, C.Greenough, D.Jackson, **M**. **Kiran**, S.MacNeil, A.Maleki-Dizaji, P.McMinn, M.Pogson, R.Poole, E.Qwarnstrom, F.Ratnieks, M.D.Rolfe, R.Smallwood, T.Sun and D.Worth, Modelling complex biological systems using an agent-based approach, Integrative Biology, 2012
- Inventario de riesgos de la computacion en la nube: cuestiones legales, Por K.Djemame, M.Jiang, **M**. **Kiran**, D.Armstrong, B.Barnitzke, M.Corrales, N.Forgo, Citar: elDial.com - DC17AF Publicado el 15/02/2012 Copyright 2012 - elDial.com - editorial albrematica - Tucuman 1440 (1050) - Ciudad Autonoma de Buenos ires (Argentinian Journal)
- **M.Kiran**, M.Bicak, S.Maleki-Dizaji, M.Holcombe, FLAME: A Platform for High Performance Computing of Complex Systems, Applied for Three Case Studies, Acta Physica Polonica B, Proceedings Supplement, DOI:10.5506/APhysPolBSupp.4.201, PACS numbers: 07.05.Tp, vol 4, no 2, 2011 (Polish Journal)
- **M.Kiran**, S.Coakley, N.Walkinshaw, P.McMinn, M.Holcombe, Validation and discovery from computational biology models. Biosystems 93(1-2): 141-150, 2008

Published Conference Articles:

- **M Kiran**, B Mohammad, K Maiyamara, Agent-based Modelling as a Service on Amazon EC2: Opportunities and Challenges, IEEE/ACM Utility & Cloud Computing (UCC) conference, taking place in Cyprus (December 2015)
- **M Kiran,** P Murphy, I Monga and J Dugan, Lambda Architecture for Cost-effective Batch and Speed Big Data processing, IEEE Big Data conference 2015, Nov 2015
- **M Kiran,** Portability challenges of Software from HPC to GPU cards, Architecture dependencies Workshop, Supercomputing 2015.
- **M Kiran,** Simulation complex problems, Journey from HPC to Cloud, Women in HPC, Supercomputing 2015.
- **M Kiran,** HPC to Cloud, Early Career Workshop, Supercomputing 2015.
- M Burkitt, **M Kiran,** S Konur, M Gheorghe and F Ipate, Agent-based High-Performance Simulation of Biological Systems on the GPU, 17th IEEE International Conference on High Performance Computing and Communications HPCC 2015
- P Yadav, **M Kiran,** A Bennaceur, Lilia Georgieva, Maria Salama and Amparo Eliza Cano, Jack of all Trades versus Master of one, Grace Hopper 2015 Conference, Nov 2015
- P Yadav, **M Kiran,** A Bennaceur, L Georgieva, M Salama, A Cano. Impact of Gender Diversity and Equality Initiatives, WomENcourage, Uppsala, Sweden, Oct 2015
- B Mohammed, **M Kiran,** Analysis of Cloud TestBeds using OpenSource Solutions, 3rd Int. Conf on Future Internet of Things and Cloud, Rome, Italy, Aug 2015
- A Al-Ou'n**, M Kiran** and D Kouvatsos, Optinal Agent-based VM allocation policy, The 3rd Int. Conference on Future Internet of Things and Cloud, Rome, Italy, Aug, 2015
- **M Kiran**, Modelling Cities as a Collection of TeraSystems–Computational Challenges in Multi-Agent Approach, The 6th International Conference on Ambient Systems, Networks and Technologies (ANT-2015), London, UK

- **M Kiran,** A JH Simons, Model-Based Testing for Composite Web Services in Cloud Brokerage Scenarios, Advances in Service-Oriented and Cloud Computing, 190-205, published at conference (CSB-2014). Co-located with 3rd European Conference on Service-Oriented and Cloud Computing (ESOCC 2014), Manchester UK,Sept, 2014.
- Edited Book of the 2014 14 th UK Workshop on Computational Intelligence (UKCI) D Neagu, M Kiran, P Trundle
- **M. Kiran,** Towards a Cloud-based framework for Smart Connected Manufacturing, EPSRC conference, Glasgow, UK
- **M. Kiran,** towards Cloud computing and Big Data mechanisms to make all information open information, Need for trustworthy secure Cloud environments, CHIST-ERA Conference 2014, Istanbul, Turkey
- **M. Kiran,** Risks of Sharing Spatially located Data, INSPIRE conference 2014, Denmar**k**
- **M Kiran,** A Friesen, A J H Simons and W K R Schwach, Model-based Testing in Cloud Brokerage Scenarios, Proc. 1st. Int. Workshop on Cloud Service Brokerage. Service-Oriented Computing - ICSOC 2013 Workshops, LNCS 8377, eds. A R Lomuscio, S Nepal, F Patrizi, B Benatallah, I Brandic, 2 December, Berlin, Germany (Berlin: Springer Verlag, 2014), 192-208
- A U Khan, **M Kiran**, M Oriol, Threat methodology for securing scalable video in the Cloud, 8th International Conference for Internet Technology and Secured Transactions (ICITST) IEEE, London, UK, 2013
- **M.Kiran**, A.U.Khan, M.Jiang, K.Djemame, M.Oriol, M.Corrales, Managing Security Threats in Clouds, Digital Research 2012
- A.U.Khan, **M.Kiran**, M.Oriol, M.Jiang, K.Djemame, Security risks and their management in cloud computing, CloudCom 2012: 121-128
- T.Kirkham, K.Djemame, **M.Kiran,** M.Jiang, D.Armstrong, G.Kousiouris, G.Vafiadis, A.Evangelinou, Risk based SLA management in clouds: A legal perspective, In: ICITST 8th International Conference for Internet Technology and Secured Transactions, 2012
- T.Kirkham, D.Armstrong, K.Djemame, M.Corrales, **M.Kiran,** I.Nwankwo, M.Jiang, N.Forgo, Assuring Data Privacy in Cloud Transformations, In: TrustCom, 2012
- Securing the cloud: A trust, risk and security centric view of a enterprise's use of cloud computing services, Tutorial on Risk Assessment presented in 5th IFIP International Conference on Trust Management (IFIPTM 2011), July, 2011, Copenhagen, Denmark
- **M.Kiran**, M.Jiang, D.Armstrong and K.Djemame, Towards a Service Life Cycle-based Methodology for Risk Assessment in Cloud Computing, CGC 2011, International conference on Cloud and Green Computing, December, Australia, Proceedings DASC 2011: 449-456
- K.Djemame, M.Jiang, **M.Kiran,** D.Armstrong, B.Barnitzke, M.Corrales, N.Forgo, Legal Issues in Clouds: Towards a Risk Inventory, UK e-Science All Hands Meeting 2011, York, UK
- K.Djemame, D.Armstrong, **M.Kiran**, M.Jiang, A Risk Assessment Framework and Software Toolkit for Cloud Service Ecosystems, CLOUD COMPUTING 2011, The Second International Conference on Cloud Computing, GRIDs, and Virtualization, pg: 119-126, ISBN: 978-1-61208-153-3, Italy
- S.F.Adra, **M.Kiran**, P.McMinn, N.Walkinshaw: A multiobjective optimisation approach for the dynamic inference and refinement of agent-based model specifications, IEEE Congress on Evolutionary Computation 2011: 2237-2244, New Orleans, USA
- C.Greenough, S.Chin, D.Worth, S.Coakley, M.Holcombe, **M.Kiran**: An Approach to the Parallelisation of Agent-Based Applications, ERCIM News 2010(81)
- **M.Kiran**, P.Richmond, M.Holcombe, L.S.Chin, D.Worth and C.Greenough, FLAME: Simulating Large Populations of Agents on Parallel Hardware Architectures, AAMAS 2010: 1633-1636, Toronto, Canada.
- M.Bicak, **M.Kiran**, Simulating decentralised behaviour of ant colonies, The White Rose Grid e-Science, presented at HPC conference Oxford, UK.
- C.Greenough, L.S.Chin, D.J.Worth, M.Holcombe, S.Coakley, **M.Kiran**, Parallel Implementation of Large Scale Agent-based Models in Economics, Advances in Agent-

Based Computational Economics: Agent-based modelling (ADACE), Bielefeld, Germany, 05-07 Jun 2010 CSE-SEG STFC

- C.Prell and **M.Kiran** (2010), The processes of social capital and the emergence of network structure, Proceedings from Sunbelt XXX. Riva del Garda Fierecongressi, Trento, Italy. Some results of model presented here
- C.Prell and **M.Kiran** (2010), Sequencing in the use of actor-based models for simulating networks, Presented at the 6th UK Social Networks Conference, University of Manchester, Manchester, UK. Some results of model presented here.
- **M.Kiran,** Using social bulletin boards for adaptive agents in fast changing environments, presented at Int Conf. for Computational Biology, Sept 2009, Bertinoro (Forli), Italy.
- **M.Kiran,** Using the learning window to reduce complexity in reactive agents, presented at International Conference for Computational Biology, Sept 2009, Bertinoro (Forli), Italy.
- **M.Kiran,** Applying co-evolution in dynamic scenarios, talk presented at Coping with Crisis in Socio-Economic systems, ETH Zurich, Switzerland, (June 2009)**.**
- **M.Kiran,** S.Coakley, M.Holcombe, L.S.Chin, D.Worth, C.Greenough, From Biology to Economics: FLAME - A Parallel Agent-based Simulation Framework, Proceedings of European Commission Complex Systems 2007, Dresden, Germany.
- **M.Kiran,** Tale of the Oracle, Future Trends in Hypercomputation Workshop, Sheffield, UK, Sept 2006

News, Magazine articles and Evidences

- **M Kiran,** Teaching Big data through open source tools, RedHat Open source Magazine, September 2015
- **M Kiran**, Teaching how to build open source tools through software engineering courses, Redhat Open source Magazine, September 2015
- (2014) Submitted consultation for European IoT Large Scale Pilots supported by the European Commission for Smart Cities for future IoT Large Scale Pilots
- (2014) Concerns for how software is distributed through the Cloud, Consultation on Cloud Computing, EU Digital Agenda for Europe, 2014. Invited to attend by European Commission and present critique, Brussels, Belgium, November 2014
- (2014) Submitted Evidence to House of Lords Digital skills committee for Digital Skills in the UK

Book chapters

- **M.Kiran,** (2015), What is Modelling and Simulation: An introduction. Encyclopedia of Computer Science and Technology, edited by Phillip Laplante, Taylor and Francis Group
- **M. Kiran**, (2015) Legal Issues Surrounding Connected Government Services: A Closer Look at G-Clouds, Book Chapter, Cloud Computing Technologies for Connected Government, edited by Zaigham Mahmood
- **M. Kiran**, (2014) A methodology for Cloud Security Risks Management, Book Chapter Cloud Computing, 75-104, edited by Zaigham Mahmood

SOFTWARE PRODUCTS

- FLAME (C, MPI agent-based modelling for high performance computing) (https://github.com/somebloke/flame-xparser)
- OPTIMIS toolkit (Java, Maven, risk modelling for cloud deployment) (https://github.com/optimistoolkit/optimistoolkit)
- List of other projects mini projects found at https://github.com/mariamkiran

Includes all kind of agent-based models written for research using C, XML, Java, Python, etc.

SOFTWARE SKILLS

Cloud Computing:

- Porting of applications, security risk modelling, legal risk modelling, analysis of Google cloud usage data, porting grid applications to clouds, simulation using FLAME and CloudSim, developing risk methodologies for Clouds, establishing multiobjective optimisation techniques between trust, risk, eco-efficiency, cost.

Agent based Modelling:

- Analysis of various frameworks such as SWARM, MASON, FLAME, FLAME-GPU, Repast, writing tools for data analysis in C and Java, parallelisation of models using MPI, using game programming for agent learning, Mathematical modelling, teaching and managing student projects in agents, testing and analysis of models, writing/designing agent-based models, working with other disciplines like economics, biology and social networks.

Computer Programming:

- C, C++, UNIX shell scripting, MySQL, Matlab, R (Statistical Computing), Mathematica, Java, Lua, PHP, Prolog, FoxPro, VB, PHP, HTML, CSS, XML, SQL, SQLite, Maven, Google Tools, .Net tools.

Software Model Development Management:

- Eclipse, Graphviz, Netbeans, Simulink, Class diagrams and Data modelling.
- UML modelling: Visual Paradigm for UML; building use Case diagrams, Activity diagrams, and Data Flow diagrams.

Productivity Applications:

- TEX (LATEX, BibTEX, PSTricks), WinEdt, LyX, Kyle, most common productivity packages (for Windows, OS X, and Linux platforms).

Security Applications

- Symantec, Wireshark analysis, cryptography, Security algorithms, risk assessment, firewalls.

EXPERTISE

Computer Science and Engineering:

- Model Verification, Software Verification, Software testing, Finite State machines, Component-Based Reusable Software, UML, Networking & Distributed Applications, Intelligent Systems (Neural Networks, Knowledge Based Systems & Genetic Algorithms), Adaptive Control, Fuzzy Logic, Distributed Systems, Fault-tolerant analysis, Agent based systems, Mathematical Modelling, Risk and Trust Management, Cloud computing.

Mathematics:

- Applied Maths, Real & Complex Analysis, Numerical Methods and Data Analysis.

Others:

- Economics: Micro and Macro-economic modelling, game theory.
- Biology: Cell modelling.
- Sociology: Social Capital, Social network formations.

REFERENCES

Bev Bachamayer (e-mail: bev.bachmayer@intel.com)

- Technical Consulting Engineer, Intel GmbHr
- Intel, Austria, Europe
- Collaborator in Diversity Events

Professor Mike Holcombe (e-mail: m.holcombe@dcs.shef.ac.uk;
phone: +44 (0)114 222 1802)

- Professor, Department of Computer Science, Sheffield University
- Department of Computer Science, Sheffield University, Sheffield UK
- Prof. Holcombe was my PhD supervisor

Professor Mahesan Niranjan (e-mail: mn@ecs.soton.ac.uk;
phone: +44 (0)23 80593021)

- Professor, Electronics and Computer Science, University of Southampton
- Electronics and Computer Science, University of Southampton, Southampton UK
- Prof. Niranjan has collaborated and also served as a mentor