

Erwan LE MARTELOT, Dr.

Software Engineer at Google

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WORK EXPERIENCE

- 2012 to date** **Google, Mountain View, CA, USA**
Software engineer: Design and engineering in Java and C++ on Google TV.
Algorithmic for indexing, searching, ranking on very large-scale data sets involving massively parallel and distributed computing. Natural language processing.
- 2010 to 2012** **Imperial College London, London, U.K.**
Post-doctoral Research Associate: Conception and development of new community detection algorithms enabling efficient multi-resolution analysis of large-scale data sets. Applications to various resolution criteria with both local and global approaches. Applications to crisp and overlapping communities. Design for parallel computing.
Tutor in Software Engineering: Design: object-oriented programming, systems modelling and development, and design patterns. Algorithms: randomized algorithms, string-matching algorithms, dictionary search, advanced graph algorithms, dynamic programming, linear programming and Fourier transforms.
- 2006 – 2010** **University College London, London, U.K.**
Doctorate: Investigating and Analysing Natural Properties Enabled by Systemic Computation within Nature-inspired Computer Models.
Work on complex systems, bio-inspired computing, distributed parallel computing, machine learning, computer language and architecture design, 3D visualisation.
- 2005 – 2006** **University College London, London, U.K.**
Creation within a scientific and artistic context of an original evolutionary adaptive system to study the relationships between mind, body and environment. This work led to the Fugitive Moments exhibition in Chichester in 2006.
- Summer 2004** **LIP6 (Laboratory of Computer Science at Paris 6 University), Paris, France**
Decoupling constraints checking with Prolog in Java programs.
- March – Aug. 2003** **Unilog, Paris, France**
Applicative maintenance on a national policyholders management client/server application. Migration GCos-Unix. Technologies: Cobol, Unix Shells, C, JCL, NSDK languages.
- Sept. 2002 – Feb. 2003** **University of Rennes 1, Rennes, France**
Java and Scheme tutor for computer science university students.
IRISA-INRIA, University of Rennes 1, Rennes, France
Development in Java of a C code optimisation tool for better performances in embedded systems. Project directed by INRIA and Texas Instrument.
- Summers 2002 and 2001** **IRISA-INRIA, Rennes, France – VALORIA, Vannes, France**
Research in the area of testing for design and reliability in software engineering. Development in Java and XML of the tool JMutator involving the mutation test method in Java classes.

EDUCATION AND QUALIFICATIONS

- 2006 – 2010** **Doctorate (EngD) in Computer Science**
University College London, London, U.K.
Subject: Investigating and Analysing Natural Properties Enabled by Systemic Computation within Nature-inspired Computer Models
Academic supervisor: Dr Peter J. Bentley
Synopsis: Systemic Computation (SC) is a novel computation paradigm and corresponding computer architecture addressing the incompatibilities between electronic and natural computation by incorporating at its core properties found in natural systems. My thesis investigated and developed SC by assessing its potential to enable exploitation and analysis of natural properties within nature-inspired computer models. It presented the first high-level complete systemic computer, also including a visualisation framework, and then models developed to study the properties of self-adaptation, fault-tolerance, crash-proof computing, self-repair, homeostasis, flexibility and self-organisation. Throughout its various case studies, the thesis demonstrates how the rules and native natural properties provided by SC can be exploited to build improved natural properties.
- 2004 – 2005** **Master of Research in Computer Science**
University Pierre et Marie Curie – Paris 6, Paris, France
Specialised in Artificial Intelligence and Decision; additional focus on Multimedia, Image and Sound Processing
- 2000 – 2003** **Master of Science in Computer Science (DIIC - Diplôme d'Ingénieur)**
IFSIC, University of Rennes 1, Rennes, France
specialised in Languages and Computer Systems
- 1998 – 2000** **DEUG SIR (2 years University Degree) in Computer Science**
University of Bretagne Sud, Vannes, France

SKILLS

Computing

Operating Systems	Unix based systems (MacOS X, Linux), Windows, Dos
Languages	C++, C, Java, C#, Matlab, XML, Eiffel, Prolog, Unix Shells, ASM, Latex
Data Structures	Lists (dynamic, skip), Trees (random, binary, self-balancing), Graphs representations, Hash tables, Bloom filters
Animation and Rendering	3D (Java3D, Direct3D, OpenGL), 2D Engine (C/C++, SDL, Gtk+, C#, DirectDraw)
Internet/Networks	HTML, PHP, SQL Java, C/C++
Analysis Methods	Algorithms Complexity, UML, Design Patterns

General Algorithms

Sorting Algorithms, Graph Algorithms, Community Detection in Networks, String-matching Algorithms, Randomised Algorithms

Nature/Bio-inspired Computation

Modelling of Nature-inspired Systems, Natural Properties Based Models, Emerging Behaviour, Complex Systems, Genetic Algorithms, Artificial Neural Networks, Artificial Immune Systems, Gene Regulatory Networks, Ant Colony Optimisation, Genetic Programming, Swarm Intelligence

Computer Graphics

Ray Tracing, Radiosity, Abstract Graphics Generation, Fractal Algorithms, Terrain and Landscape Generation, Image Processing, Mathematical Morphology, Face Detection

Physics-inspired Systems

Physics-based Engines, Force-directed Layout Algorithms, 2D Game Engines

Decision and Probabilistic Models

Decision trees, Pattern recognition, Markov models, Bayesian networks

Project Management

Autonomy, Organisation, Self-teaching, Professional Software Quality, Strict Deadlines Ability

Communication skills

- Teamwork experience involving computer scientists, biologists or artists – academics or engineers.
- Ability to take the lead and control a team.
- Good relational abilities.
- Experience of work presentation to a wide audience at local meetings or international conferences.
- Publication of scientific papers in books, journals and conferences for an international audience of researchers and computer scientists.

Driving License

Full clean Californian and French licenses

LANGUAGES

French	Native speaker
English	Proficient
Spanish	Conversational

EXTRA-CURRICULAR ACTIVITIES

Sports	Martial Arts (2 nd Dan in Soo Bahk Do, 4 years of Karate), Sailing
Music	Guitar player, Celtic music fan
Travels	Austria, Belgium, Brazil, Canada, Caribbean, Czech republic, Egypt, England, France, Germany, Greece, Hungary, India, Ireland, Italy, Japan, Malaysia, Mexico, Morocco, Nepal, Portugal, Scotland, Singapore, Spain, Thailand, U.A.E., U.S.A., Wales

REFEREES

Pr. Chris Hankin	Imperial College, London, U.K.	✉ c.hankin@imperial.ac.uk	☎(+44) 207 594 8266
Dr. Peter J. Bentley	UCL, London, U.K.	✉ p.bentley@cs.ucl.ac.uk	☎(+44) 207 679 1329
Dr. R. Beau Lotto	UCL, London, U.K.	✉ lotto@ucl.ac.uk	☎(+44) 751 556 3260
Pr. Sarah Rubidge	University of Chichester, U.K.	✉ s.rubidge@ucc.ac.uk	☎(+44) 798 442 2056