JOHAN BERNTSSON M Sc, PhD (computer science)

Contact Details

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Summary

- My career ambition is to work in R/D-related activities with focus on customer-oriented problem solving and product development.
- International working experience in Sweden, Japan, USA, Russia, and Germany.
- Extensive experience in design and implementation of software and hardware projects.
- Project management role in small R/D projects, and team working experience in big nuclear power simulation projects (typically 10-20 members, 1-2 years).

Skills and Experience Highlights

Strong skills:

- Problem analysis and software design
- Distributed computing (TCP/IP, grid computing, peer-to-peer)
- Soft computing technologies (such as genetic algorithms, simulated annealing)

Major projects:

- Core developer of the OpenSim and OpenClient virtual world projects (open source)
- Full scale nuclear simulator development: C, Java, C++, Unix, X/Motif, Oracle DB, SQL
- Multi-media training simulator project: Windows NT, C++, MFC
- I/O development: project management, Linux driver and kernel development
- IBM healthcare research: Java (J2EE), Perl, grid computing
- PhD genetic algorithm research: C#/.NET, Windows Forms, distributed computing
- Open source project Kazam (http://sourceforge.net/projects/kazam): C++, wxWidgets
- Linux games & utilities: C, C++, KDE/Qt

Mathematics:

- Operational research (optimization) and statistics: non-parametric testing, Bayesian probability, mathematical modeling in Matlab

Operating systems:

- Windows NT/XP:
  - Application development
  - System administration (installation, user administration, security)
- Unix/Linux
  - Application development
  - Version handing with git and svn
  - System administration (scripting (csh, Ruby, awk, Perl), networking, etc.)
  - Kernel debugging and driver development

Graphical user interfaces:

- KDE/Qt: Standard GUI libraries on Linux
- wxWidgets: cross-platform GUI library used in the Kazam project (see above)
- MFC, Windows Forms: Microsoft's object-oriented GUI class libraries
- X/Motif: data visualization and user interaction in Unix applications

Employment History

Business Owner & IT Consultant, BrainPlus LLC, Japan 2006 -

In June 2006 I started my own IT consulting business. My clients are mainly in the Japanese nuclear power business, and include Genden Information Systems (GIS) and GSE Power Systems. I have worked in three full-scope simulator project, with responsibilities including development of new 3D data visualization and graphical display systems, simulator software upgrades, and giving lectures on nuclear simulation software for Japanese engineers.

Technical lead & IT Consultant, 3Di Inc., Japan 2007-

From November 2007 – March 2008 I worked fulltime as a technical lead and senior systems engineer at 3Di, a part of the NGI group in Tokyo, Japan. 3Di creates virtual worlds similar to Second Life, using open source projects called OpenSim and OpenClient. I was a core developer in those project, as well as the technical lead for the development group at 3Di, designing and directing the work on various server improvements, resulting in new modules for dynamic load balancing, data mining, and performance improvements. From April 2008 I've been consulting for 3Di.

Senior Systems Engineer, GSE Power Systems, Sweden/Japan 1994-2002, 2006-

GSE is an American maker of simulators for nuclear and process industry. It is a high tech business, with large-scale projects all over the world. A nuclear simulator is a process intensive application, and each installation consists of a cluster of workstations. A large number of concurrent processes need to exchange information, share resources and guarantee performance. One of my main activities was to make cluster design and solve problems in a multiprocessor environment.

I was the resident representative of GSE in Japan 1995-2002, involved in R&D, programming, I/O system design, and customer support. From 2006 I've been consulting for GSE in connection with Japanese projects.

Main activities:

- 2008: System specification and PPC development in two full-scale nuclear simulator projects for Japc/GIS in Japan.
- 2001: Supervised a European Union funded simulator upgrade project in Smolensk, Russia. My role was to monitor progress and provide expert advice to local engineers. The project was successfully concluded in late 2001.
- 2000: Prepared a report on future simulator designs for TEPCO, Japan.
- 1999: Presented a I/O system paper at the SimWorld conference in Kyoto, Japan.
- 1998: Project manager for new I/O system implementation, based on Echelon LON technology. Spent one month working with our subcontractor in Paderborn, Germany. The system was successfully introduced on three full-scale simulator projects in Japan 1998-2000.
- 1996: R&D project on creating nuclear control room simulations using VR technology resulted in a working prototype system, suitable for classroom use.
- 1995: Relocated to Japan.
- 1994: Worked mainly with design and optimization of database support for simulator process computers, and I/O system design.

Visiting Scientist, IBM Almaden Research Center, USA 2005

I did a three-month academic exchange program at IBM in Silicon Valley, designing and implementing a massive grid-based solution for generating synthetic electronic health records, as part of a wider IBM initiative in research on IT-solutions for the health care industry. The system successfully simulated 50 million agents on a 70 computer cluster.

SAAB Military Aircraft, Sweden, 1994

SAAB make jet fighter aircraft. While writing on my M.Sc dissertation I worked with optimization problems in curing of composite plastics, used in the hull of the aircrafts. I created an expert system using case-based reasoning to solve the problem.

Education and Training

PhD studies, Queensland University of Technology, Brisbane, Australia, 2002-2006

Dissertation: *An Adaptive Internet-based Framework for Distributed Genetic Algorithms*

My PhD project enables non-experts to create distributed genetic algorithms (DGA) that work efficiently in a dynamic grid-computing environment. The DGA is implemented in a cycle-stealing peer-to-peer architecture, and uses on-line performance monitoring and adaptation to automatically adjust its parameters in order to ensure efficiency and robustness. Research questions included developing methods to collect relevant data and strategies for adaptive load balancing and routing. The system was validated in simulations and in large-scale scalability tests on a computer cluster using a NP-hard VLSI floorplanning application.

Scholarships & awards:

- Microsoft Research Grant, 2002-2004.
- QUT Blueprint Research Award 2004-2006.

Publications

- J. Berntsson, N. Lin, and Z. Dezso, “ExtSim: A Flexible Data Mapping and Synchronization Middleware for Scientific Visualization in Virtual Worlds,” in Journal of Virtual Worlds Research, issue 5, vol 2, pp. 4-13: Virtual Worlds Institute, 2010.
- J. Berntsson, "G2DGA: An Adaptive Framework for Internet-based Distributed Genetic Algorithms," in Proceedings of the Genetic and Evolutionary Computation Conference Workshop, pp. 346-349: ACM Press, 2005.
- J. Berntsson and M. Tang, "Dynamic Optimization of Migration Topology in Internet-based Distributed Genetic Algorithms," in Proceedings of the Genetic and Evolutionary Computation Conference, vol. 2, pp. 1579-1580: ACM Press, 2005.
- J. Berntsson and M. Tang, "Adaptive Sizing of Populations and Number of Islands in Distributed Genetic Algorithms," in Proceedings of the Genetic and Evolutionary Computation Conference, vol. 2, pp. 1575-1576: ACM Press, 2005.
- J. Berntsson and M. Tang, "A Comparative Study of Internet-based Parallel Distributed Genetic Algorithms.," in Proceedings of the International Conference on Computational Intelligence for Modelling, Control & Automation, pp. 834-844: University of Canberra, 2004.
- J. Berntsson and M. Tang. "A Slicing Structure Representation for the Multi-Layer Floorplan Layout Problem," in Applications of Evolutionary Computing: Proceedings of Evo Workshops 2004, Lecture Notes in Computer Science, vol. 3005., pp 188-197: Springer, 2004.
- J. Berntsson and M. Tang, "A Convergence Model for Asynchronous Parallel Genetic Algorithms," in Proceedings of the Congress on Evolutionary Computation, vol. 4., pp. 2627-2634: IEEE-Press, 2003.

Japanese Proficiency Test, Japan, 1996

Passed level 3 of the Japanese Government’s official test

Japanese Language, University of Gothenburg, Sweden, 1994-95

Six months intensive course in Japanese

SWETECH, Linköping University, Sweden. 1993-94

Multicultural studies postgraduate course combined with a research trip to Hong Kong, China, Korea and Japan, arranged by the department of Economics.

Computer Science and Engineering (M. Sc). Linköping University, Sweden. 1989-1994

Dissertation: Evaluation of Case-Based Reasoning Applied to Autoclave Curing
Major: Computer Science.

Qualifications

- Languages:
  Swedish (native), English (fluent), Japanese (fair), German (fair)

- Computer Languages:
  C, C#, Ruby, Java (proficient); C++, Clojure/CommonLisp (competent).

- Operating Systems (proficient):
  UNIX (Linux, HPUX, DEC Unix), Windows (Win7, .NET)

- Miscellaneous (familiar or proficient):
  git/svn version handling, Matlab, Oracle/MySQL DB, I/O systems (RTP, LON)

Personal Details

Date of birth	18 August 1968
Citizenship	Swedish/Australian dual citizenship, Japanese spouse visa
Marital status	Married. One daughter born 07/11/2000
Personal Interests	Traveling, reading, computers, and spending time with my family.

Diplomas and references are available on request.