Bruce Martin McLaren, Ph.D.

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Professional Objective

Seeking a position of leadership within an organization that does software research and development.

Summary of Qualifications

Specialist in artificial intelligence and experienced in research and development, management, software design and development, proposal writing, sales support, and customer interaction. Highlights of my career include:

- Currently, as a systems scientist in the Human-Computer Interaction Institute at Carnegie Mellon University and as a senior researcher at the Deutsches Forschungszentrum für Künstliche Intelligenz (DFKI) in Germany, I am engaged in research on human learning and intelligent tutoring systems. In addition, I co-manage a team of 6 programmers and research associates in the development and enhancement of the Cognitive Tutor Authoring Tools (CTAT), tools for developing intelligent tutoring systems.
- At CarParts Technologies and OpenWebs Corporation, I held a director's position. I was responsible for all eCommerce software development within the company. Specific responsibilities included the leadership of a team of four engineers, collaboration with product marketing on eCommerce strategy, and research into intelligent eCommerce technologies for use in the automotive aftermarket. All development was in *Microsoft .NET*. One of the key products resulting from my leadership was an intelligent B2B trading system described in http://www.pitt.edu/~bmclaren/ic-2001.doc, a conference paper I wrote for the 2001 International Conference on Internet Computing.
- I was the manager and/or technical project leader for over ten other software projects at Carnegie Group, Inc. Responsibilities included leading a software design team, requirements analysis, programming and testing software, and managing budget, schedule, and customer expectations.
- Experience in a wide variety of application areas including eCommerce, diagnostics, intelligent tutoring, documentation management, simulation, scheduling, and design.
- Extensive international experience, including leadership of software projects for clients in England, the Netherlands, and Italy. Based in England and responsible for all European consulting for an American company, the Carnegie Group, for over two years.

Education

Ph.D., Artificial Intelligence (Intelligent Systems Program), 1999
Dissertation Title: *Assessing the Relevance of Cases and Principles Using Operationalization Techniques*, University of Pittsburgh

M.S., Artificial Intelligence (Intelligent Systems Program), 1994
University of Pittsburgh

M.S., Computer Science, 1984
University of Pittsburgh

B.S., Computer Science, *Cum Laude*, 1981
Millersville University of Pennsylvania

PROFESSIONAL EXPERIENCE

Carnegie Mellon University, Pittsburgh Science of Learning Center (PSLC) & the Institute for Software Research International (ISRI)
Systems Scientist **Sept. 2002 - Present**

Performing research and development of intelligent tutoring systems, collaborative learning, and metacognition. Also, co-managing a group of six research programmers in the development of tools for authoring intelligent tutoring systems.

Deutsches Forschungszentrum für Künstliche Intelligenz, Competence Center for e-Learning
Senior Researcher **July 2006 – Present**

At DFKI I am working on the ARGUNAUT project, which is focused on developing educational technology to help teachers moderate collaborative e-Discussions. Together with two students of mine, Oliver Scheuer and Jan Miksatko, we are investigating the use of machine learning techniques to learn what students are doing in e-Discussions and then using the resultant classifiers to support moderation. I am also participating in research within the ActiveMath group.

CarParts Technologies / OpenWebs Corporation **May 2000 - Nov. 2002**
Director, eCommerce Technologies **(April 2002 - Nov. 2002)**

After CarParts Technologies purchased OpenWebs Corporation, I assumed additional responsibilities. In particular, I led a team of four engineers that developed and deployed eCommerce technologies and products in the automotive aftermarket. Additional responsibilities included leading all eCommerce projects within the company, devising eCommerce strategy in conjunction with a product management team, and researching the application of intelligent technologies to eCommerce.

Director, Research and Development **(May 2000 - Mar. 2002)**

During my time at OpenWebs Corporation, I was the leader of a team that developed an intelligent B2B trading product. Promoted to the director position from a manager's role in May 2001. Responsibilities included the management of two software engineers; leadership of all phases of software development, and research of advanced Internet technologies. All technology developed using Microsoft .NET.

The IBM Transarc Laboratory **March 1999 - Feb. 2000**
Independent Consultant (Part-time employment while completing Ph.D.)

Perl developer, JavaScript developer, Enterprise Java Bean system tester, and technical writer for transaction processing middleware products. During my tenure with Transarc, I gained familiarity with distributed processing, N-tier architectures, and the Unified Modeling Language (UML).

Maya Design Group **Aug. 1998 - Feb. 1999**
Independent Consultant (Part-time employment while completing Ph.D.)

Project manager, technical leader, and developer for a project involving information visualization and intelligent scheduling. Responsible for scoping project, maintaining client relations, and providing technical leadership. Developed a prototype scheduling interface in Java (using Swing components).

Carnegie Group, Inc. **Sept. 1986 - May 1998**
Project Manager **(May 1996 - May 1998)**

Responsible for managing projects, writing proposals, acting as lead designer, and handling customer interactions. From November 1996 to August 1997, I wrote two winning proposals of approximately $100,000 each that were executed by a team of two engineers. The projects involved consulting with the Unisys Corporation and developing application software for improving field service support.

I was originally promoted to project manager to oversee international application projects with a customer headquartered in the Netherlands. In this capacity I was responsible for technical design and development, proposals, budgets, customer contact, and management of a small (2-3 person) project team. Frequent international travel to Europe was required. I led a project intended to provide field engineers with a user-friendly, consistent interface to local and remote applications on a laptop computer.

Senior Engineer **(Jan. 1989 - April 1996)**

Responsible for the design and implementation of knowledge-based applications in the areas of diagnosis, intelligent tutoring systems, text processing, manufacturing design and configuration. During a seven-year period, I was a senior engineer and/or project leader on the following seven projects:

- Project leader on a four person diagnostic application project for Philips Medical Systems. The project involved the extension and customization of Carnegie Group's TestBench product. I programmed in Visual Basic and C for this project.
- Lead designer and developer of an intelligent tutoring system developed for the U.S. Army. I developed a prototype tutoring system in Smalltalk to train enlisted soldiers in troubleshooting.
- Lead designer and project leader of a case-based reasoning module for the TestBench product. This module was added as a standard component of the company's product offering.
- Designer and developer on a project team to develop a technical documentation authoring system. The authoring system was developed for Caterpillar, Inc. and is currently being used to generate documentation in up to 12 languages. I was the sole designer and developer of the user interface (in C and Motif). This application was awarded Patent Number 5,677,835.
- Designer and project leader on a project team for a technical documentation management system. This system was designed and developed as a research and development effort for the Pennsylvania State government. I was the project lead of a three-person project team. I programmed in Common Lisp and HyperCard on this project.
- Designer and developer for a motor configuration system for Emerson Motors, Inc. Carnegie Group later marketed and resold this system as a general-purpose software tool. I programmed in Knowledge Craft and Common Lisp on this project.
- Designer and developer of an electronic circuit layout program. I was responsible for the requirements analysis, design, and implementation of a design support system used for assisting in the physical layout of electronic circuits on vehicle plan forms for the Ford Motor Company. I programmed in Knowledge Craft and Common Lisp on this project.

Senior Consultant (Carnegie Group in England) **(Sept. 1986 - Dec. 1988)**

During a 2 and 1/4 year stint for the Carnegie Group office in England, I was responsible for the company's expert systems projects in Europe. Tasks included: sales presentations and demonstrations, writing of proposals and technical reports, management and execution of project work, contributing to strategic decision making, and the hiring and training of new U.K.-based employees. I assumed primary responsibility for two projects:

- Knowledge-based simulation of a printed circuit board plant in Italy. I was responsible for the proposal, feasibility study, design, and implementation of an AI simulation modeling package for Italsim, an Italian communications company. I was project manager of two to four people over a period of 14 months. I programmed in Knowledge Craft and Common Lisp on this project.
- Turbine-generator diagnosis for the Central Electricity Generating Board (CEGB). I was responsible for the knowledge acquisition, design, and implementation of a prototype system used to diagnose faults in turbine-generators. I developed a novel diagnostic approach that has since been reused in other Carnegie Group projects. I programmed in Knowledge Craft and Common Lisp on this project.

Robotics Institute, Carnegie Mellon University **Jan. 1985 - Sept. 1986**
Project Supervisor, *Research Programmer*

Project Supervisor of a seven person job-shop scheduling project in the Intelligent Systems Laboratory. Responsible for development and delivery to the customer, IBM. The Opportunistic and Intelligent Scheduling System (OPIS) is a well-known system in the application of Artificial Intelligence to manufacturing scheduling problems. I programmed in Knowledge Craft and Common Lisp on this project.

University of Pittsburgh **Sept. 1983 - April 1986**
Part-time Instructor of Computer Science

First taught as a graduate teaching assistant and later returned as a part-time faculty member. Full responsibility for introductory Computer Science courses. Duties included preparing and presenting lectures; designing, preparing, and grading all course work; assigning final course grades. Taught courses in Pascal and Basic.

General Electric (Locomotives Division) **Oct. 1981 - Dec. 1982**,
Programmer **Summers of 1983 and 1984**

Responsible for designing, implementing, and maintaining various manufacturing business systems in a conventional data processing shop. I was the lead programmer in the development of an automated warehouse distribution system. I programmed in Cobol, Screenwrite, and IDS during my tenure at General Electric.

TECHNICAL SKILLS SUMMARY

Languages:	ASP.NET and VB.NET (6 months), Visual Basic (3 Years), Common Lisp (10 years), Perl (1.5 years), Smalltalk (1.5 years), Java (6 months), JavaScript (2 months), C (2 years), Cobol (2 years), Pascal (Academic), Fortran (Academic)
Hardware:	PC, Macintosh, Sun workstations, Vax series computers
Operating Systems:	Windows-NT, Windows-98, Macintosh, Unix, VMS

AWARDS AND RECOGNITION

- **Finalist for the Best Paper Award**. *Studying the Effects of Personalized Language and Worked Examples in the Context of a Web-Based Intelligent Tutor*; McLaren, B. M., Lim, S., Gagnon, F., Yaron, D., and Koedinger, K. R. In the Proceedings of the 8th International Conference on Intelligent Tutoring Systems, Jhongli, Taiwan, June 26-30, 2006.
- **Best Paper Award**. *Toward Tutoring Help Seeking: Applying Cognitive Modeling to Meta-Cognitive Skills* by Aleven, V., McLaren, B. M., Roll, I. and Koedinger, K. R. In the Proceedings of the Seventh International Conference on Intelligent Tutoring Systems (ITS-2004). Maceio, Brazil.
- **Engineering** Times **Article**, July 2001. *NSPE Ethics Cases Meet Artificial Intelligence*. Article written about my Ph.D. research.
- **Patent Currently Under Review, Number PCT/US01/05609**. Submitted in February 2001. *Method and System for Creating and Using a Peer-to-Peer Trading Network*. Jointly submitted with Philip J. Hayes and Aidan J. McKenna of OpenWebs Corporation.
- **Patent Number 5,677,835**. *Integrated Authoring and Translation System*. Jointly held with a team from Carnegie Group, Inc. and Carnegie Mellon University. Awarded in October, 1997.
- **Most Distinguished Paper Award**. *Reasoning with Reasons in Case-Based Comparisons*. The First International Conference on Case-Based Reasoning, 1995, Sesimbra, Portugal. Co-authored with K. D. Ashley. Based on my 1994 Artificial Intelligence Masters project.

PUBLICATIONS

- Co-author of more than fifty (50) papers presented at a variety of commercial and academic conferences and workshops. Specific citations available upon request or on my home page (www.pitt.edu/~bmclaren/publications.html).

PERSONAL ACHIEVEMENTS

Hiked the entire Appalachian Trail, Georgia to Maine, in 1989.

See http://www.pitt.edu/~bmclaren/references.html for references.
See http://www.pitt.edu/~bmclaren/skills.html for additional details on my skills.