

Stephen Karpik, Ph.D.

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Professional Profile

- ◆ Resourceful, creative project manager, problem-solver and supervisor with proven aptitude to analyze and translate complex scientific, technical and business problems into innovative solutions.
- ◆ Articulate communicator who fluently speaks the languages of both people and technology, blending technical expertise with exceptional interpersonal skills while interacting effectively with colleagues, stakeholders, senior management, technical and design staff.
- ◆ Persuasive communications professional adept at delivering presentations, reports and briefs to both technical and non-technical audiences with a proven ability to align disparate interests.
- ◆ Experienced systems analyst and architect responsible for designing installations that integrate hundreds of network-enabled devices, multimedia kiosks, SQL databases, legacy systems and data-driven websites.
- ◆ Digital and new media expert who facilitates communications, marketing and building communities of interest through Web 2.0 design principles, human-computer interaction theory and natural user interfaces.
- ◆ Through leveraging prior experience in the design and implementation of e-commerce strategies, enables the seamless and profitable delivery of programs, products and services.
- ◆ Delivered both network infrastructure and award-winning websites through disciplined project management and leadership skills that contained project scopes and resulted in timely delivery.
- ◆ Sustained a progressive career path through ongoing research and learning to offer projects and teams leading-edge analysis, design and integration strategies.
- ◆ Driven to satisfy clients and earn their confidence by building relationships, clearly communicating solution strategies and product offerings, architecting tailor-made client solutions, and providing technical expertise, support, and training to clients, team members and senior management.
- ◆ Established scientist with an extensive peer-reviewed publication history in the areas of environmental fluid dynamics, air and water pollution modeling, climatology, biophysics and massively parallel scientific computing.

Areas of Expertise

- ◆ Multidisciplinary Team Leadership
- ◆ Project Management
- ◆ Web Site Usability
- ◆ Web 2.0 Design and Implementation
- ◆ Digital Communication and New Media
- ◆ E-Commerce Business Analysis
- ◆ Systems Design
- ◆ Computer Science
- ◆ Network Design and Security
- ◆ Human-computer Interaction
- ◆ Social Implications of Technology
- ◆ Coaching and Mentoring
- ◆ Applied Mathematics
- ◆ Mechanical Engineering (Fluid Dynamics)
- ◆ Theoretical Physics
- ◆ Environmental Risk Assessment
- ◆ Formal and Informal Science Education
- ◆ Teaching and Course Development

Software Development Experience and Proficiencies

- ◆ Software development in multi-platform N-Tier architectures
- ◆ Application of structured tools and techniques to the development of software
- ◆ Agile software development
- ◆ Scientific computing (engineering, environmental and biological fluid dynamics, turbulence modeling)
- ◆ Design tools (Photoshop, Illustrator)
- ◆ Microsoft Project and Visio
- ◆ ASP.Net (C# and Visual Basic), XML, HTML, HTML5, CSS, SQL Server and Business Intelligence technologies, Flash, ActionScript, Flex
- ◆ Content Management Systems (DotNetNuke, Drupal and SharePoint)
- ◆ Computer-aided software development tools (Visual Studio, SQL Management Studio, Dreamweaver)

Professional Experience

Senior Scientist, Technology and Computers / Supervisor, Exhibit Information Technology Group / Supervisor, Web Team, Ontario Science Centre, 1996-present

- ◆ As Project Manager, defined and directed project goals, objectives, critical success factors, milestones and risks in the production of award-winning web sites for the Ontario Science Centre and for contract clients, finishing on time and under budget.
- ◆ Led the technical evolution of the Ontario Science Centre web properties – www.OntarioScienceCentre.ca, www.RedShiftNow.ca (now offline) and www.cafescientifique.ca (now offline) – from a single, simple HTML-based web site (1996) to a classic ASP-based web site (1999) to an ASP .NET 1.1 web site (2003) with the integration of Web 2.0 features into several sites (2005) and finally to open source ASP .NET 3.5 content management system-based web sites (2008).
- ◆ As Project Manager and Technical Lead for the RedShiftNow web site, managed the development of the world's first science centre web site that embraced Web 2.0 and social media technologies and approaches to communicate with users.
- ◆ As Team Lead and Project Manager, oversaw the conceptualization, design and coding of the award-winning Strange Matter Exhibit web site (www.strangematterexhibit.com) for the Materials Research Society. Under my leadership, the project was both under budget and ahead of schedule. The web site won the Scientific American 2004 Sci/Tech Web Award – one of 50 web sites deemed to be the most innovative, creative and valuable as science and technology resources; the American Association of Museums 2004 Bronze MUSE Award in recognition of the highest standards of excellence in the use of media and technology for the interpretation and education in science; and the International Association of Webmasters and Designers' 2003-2004 Golden Web Award in recognition of creativity, integrity and excellence on the web.
- ◆ Developed, designed and implemented concepts for numerous digitally-based visitor experiences and exhibits about computer technology that made science education more accessible to the public.
- ◆ Supervised OPSEU unionized staff who implemented and operated the exhibit computer network including VLAN topology, IIS servers and firewall/security infrastructure.
- ◆ In collaboration with PIVoD Technologies (Australia), supervised the design and implementation of a major multimedia control system to manage two showcase exhibit halls including the sequencing of multimedia exhibits, lighting and sound controls.

- ◆ Developed e-commerce solutions that integrated legacy ticket purchasing and fundraising systems with the main corporate web site in compliance with the Freedom of Information and Protection of Privacy Act and the Payment Card Industry Data Security Standard (PCI DSS), generating increased sales and reducing labour costs.
- ◆ Provided technical leadership, mentoring and supervision of the web team and information technology group so that both groups were able to provide excellent service to internal and external clients in fields where the technology and environment is rapidly changing.
- ◆ Implemented web traffic monitoring, first using Webtrends, then Google Analytics, for the OSC's websites, auto-generating monthly and annual reports relied upon by senior management to evaluate marketing and science communication strategies. The web traffic data were also used by me and the web development teams that I led to provide us with the information we needed to adapt our web authoring processes to changes in browser preference and display sizes.
- ◆ To facilitate better sharing of information, managed the development of numerous Intranet sites in support of larger projects to provide a blog-style format for staff, resulting in better anticipation of needs and recognition of problems so as to generate solutions more quickly.
- ◆ Complied with the Accessibility for Ontarians with Disabilities Act (AODA) and the Americans with Disabilities Act when developing websites and digital media products.
- ◆ Crafted science communication in service of visitors and the broader public that respected cultural and gender diversity.

Assistant Professor, Computational Fluid Dynamics

Mechanical Engineering, University of Toronto, 1990-1996

- ◆ Taught graduate and undergraduate courses on mathematics, computer science, fluid mechanics, and numerical analysis.
- ◆ Supervised two Postdoctoral fellows, four Ph.D., two M.A.Sc., one M.Eng., and 19 B.A.Sc. students (fourth year honours projects).
- ◆ Chaired the Faculty of Engineering Computer Facility Committee and participated as a member of the High Performance Computing Committee to modernize the computing curricula for engineering students.
- ◆ Undertook research and publishing in the areas of environmental fluid mechanics, computational biofluids and massively parallel computing theory.

Post-Doctoral Fellow, Geophysical Fluid Dynamics

Department of Physics, University of Toronto, 1987-1990

- ◆ Developed a computer model for the large-scale simulation of the global atmospheric circulation for application in a study of climate change, publishing results in the SIAM Journal of Numerical Analysis.
- ◆ Improved the computational efficiency of a model for the mesoscale transport of air pollutants.

Post-Doctoral Fellow, Boundary Layer Modeling

Atmospheric Environment Service, 1986-1987

- ◆ Developed a personal computer-based model for turbulent air flow in complex terrain for application in micrometeorological air pollution studies and for wind energy site assessments.
- ◆ Presented results of the research at the First International Congress of Industrial and Applied Mathematics.

Contract Research

Atmospheric Environment Service, Downsview, Ontario, “MSFD-PC Computer Package Model Development,” 1993-1994.

Desom Environmental Systems Ltd., Newmarket, Ontario, “Numerical Modeling of Building Ventilation,” 1994.

General Motors Technical Center, Detroit, Michigan, “Numerical Modeling of Fluid Flow in Electrocoat Tanks and Paint Spray Booths,” 1992.

The Ontario Nuclear Safety Review, “A Critical Review of the Province of Ontario’s Nuclear Emergency Atmospheric Dispersion Model,” 1987.

Volunteer Work

Over twenty years experience as a licensed cycling coach affiliated with the Ontario Cycling Association.

Education and Training

DEGREE PROGRAMS

Ph.D., Mechanical Engineering (computational environmental fluid dynamics)
University of Waterloo, 1985.

M.Sc., Physics (theoretical and computational astrophysics)
Queen’s University, 1981.

B.Sc. (with distinction), Physics (theoretical physics and applied mathematics)
York University, 1979.

NON-DEGREE PROGRAMS

- ◆ **Emerging Exhibits: Exploring New Models of Human Computer Interaction**
Taught by Jim Spadaccini (founder and CEO of Ideum), Cultural Resource Management Program, University of Victoria Continuing Studies, April 9-25, 2012.
- ◆ **Complete iPhone/iPad Software Development**
New Toronto Group, September 27, 2010-October 1, 2010.
- ◆ **Negotiation Workshop (Alternative Dispute Resolution), Certificate Program**
University of Windsor, July 12-15, 1999.
- ◆ **Programming the KSR1 Parallel Computer**
University of Toronto, 1995.
- ◆ **Programming on the Cray Computers**
Atmospheric Environment Service, 1987.

ONTARIO PUBLIC SERVICE COURSES

- ◆ ISPC – Information Security and Privacy Classification, March 14, 2012
- ◆ Information Security – It’s Everyone’s Responsibility, March 14, 2012
- ◆ Bill 168: An Overview, November 1, 2010
- ◆ Workplace Discrimination and Harassment Prevention, November 1, 2010
- ◆ Workplace Violence Prevention, November 1, 2010
- ◆ May I Help You? Welcoming Customers with Disabilities, March 31, 2010

Awards and Honours

SELECTED PROFESSIONAL AWARDS

Senior Computer Scientist and Technical Architect for the Weston Family Innovation Centre that was awarded the **2008 Association of Science-Technology Centers (ASTC) Roy L. Shafer Leading Edge Award for Visitor Experience** in a large institution.

Team Lead and Project Manager for www.StrangeMatterExhibit.com that was awarded:

- the **Scientific American 2004 Sci/Tech Web Award** – one of 50 web sites deemed to be the most innovative, creative and valuable as science and technology resources;
- the **American Association of Museums 2004 Bronze MUSE Award** in recognition of the highest standards of excellence in the use of media and technology for the interpretation and education in science; and
- the **International Association of Webmasters and Designers’ 2003-2004 Golden Web Award** in recognition of creativity, integrity and excellence on the web.

ACADEMIC SCHOLARSHIPS

- ◆ **N.S.E.R.C. Visiting Fellowship**, Atmospheric Environment Service, 1987.
- ◆ **N.S.E.R.C. Visiting Fellowship**, Atmospheric Environment Service, 1986.
- ◆ **Faculty of Engineering Graduate Scholarship**, University of Waterloo, 1982-83.
- ◆ **Faculty of Engineering Graduate Scholarship**, University of Waterloo, 1981-82.
- ◆ **Ontario Graduate Scholarship**, University of Waterloo , 1982-83.
- ◆ **Ontario Graduate Scholarship**, University of Waterloo, 1981-82.
- ◆ **N.S.E.R.C. Scholarship**, Queen’s University, 1980-81.
- ◆ **N.S.E.R.C. Scholarship**, Queen’s University, 1979-80.
- ◆ **Physics Scholarship**, York University, 1978.
- ◆ **In Course Scholarship**, York University, 1976.
- ◆ **Entrance Scholarship**, York University, 1975.

Scholarly Publications, Reports and Presentations

Nineteen refereed full journal papers, six refereed abstracts, three major technical reports commissioned by government and industry, nine invited lectures and 15 conference presentations.