

HAROLD NICHOLAS NAGEL, PhD
Senior Machine Learning Scientist
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OBJECTIVE

To continue working toward the advancement and application of machine learning methods and principles to solve problems revolving around image processing, computer vision, art, language processing, data analysis, visualization, and more.

QUALIFICATIONS

- Strong scientific background (PhD in cognitive science) coupled with extensive formal education and experience in artificial intelligence, machine learning, human and computer vision, perception and cognition, and language processing.
- Decades of experience working with a wide range of programming languages and technologies to create innovative and engaging user experiences for standalone systems, the Internet, and the World Wide Web.
- Advanced artistic and graphics creation skills acquired through formal education and continuing artistic productions.

PROFESSIONAL EXPERIENCE

Senior Software Architect, RaySecur, Westwood, MA. (2018 – 2024)

- Authored and implemented an NSF funded research and development program to integrate computer vision, networking and machine learning systems aimed at automating threat detection and augmenting operator perception through visual processing enhancements using THz sensing technology. Program funded in excess of 1.75 million USD over 2 years.
- Architected, implemented and integrated prototype machine learning systems using THz imaging technology.
- Architected and Implemented a modern user interface and experience (utilizing web-based UI/UX development technologies on electron) enabling integration of a cutting edge THz imaging system designed for mail system threat detection and contraband interdiction.
- Architected and implemented features enabling network integration and integration of peripheral devices and subsystems.
- Architected and implemented infrastructure enabling P2P streaming and distributed application features for deployed systems using Progressive Web APP standards and technologies.
- Hired and grew a software engineering team of 5 to support and continue development of software systems associated with THz imaging hardware.
- Developed an internship program in participation with North Eastern University resulting in the successful completion by 6 participants and direct full time hiring of 2 head.

Senior Software Engineer, Good&Co, Boston, Ma (2017 - 2018).

- Created and maintained node.js/express web app engineered for responsive user experiences and search engine optimization.
- Developed 'gamified' web widgets (i.e., full-fledged web applications appearing on third party host pages) using react/redux and custom responsive implementations.
- Implemented authentication scheme and single sign on using oauth and third party authentication.

Senior Software Engineer, Empower Retirement, Boston, Ma (2013 - 2017).

- Contributed to the architecture and implementation of single-page angular web-app enabling retirement income modeling and visualization.
- Engineered a node.js system for scaffolding and testing business rules independent of UI enabling separation of concerns and abstraction of business logic to a re-usable node.js application layer.
- Developed Java Spring-Batch applications and components embodying parallel implementations of said business logic.

Software Engineer (contractor), Charles River Analytics, Cambridge, MA (2012 - 2013).

- Developed a US Air Force pilot training simulation using C++, OpenGL, and WWW geospatial technologies. Implemented features related to graphics, game-based training, and artificial intelligence.
- Developed an-object oriented HTML5 framework for microgame authoring including an animation framework, asset management, and AI aspects (sprite behavior).
- Developed geospatial data import/export enabling desktop systems integration with mobile devices in an Emergency Response control system.
- Integrated Java-based UI visualization using NASA WorldWind with an unmanned vehicle planning system for unmanned vehicle administration training.

Software Architect, Pegasystems, Cambridge, MA (2010 - 2012).

- Contributed to the development and maintenance of enterprise web-applications supporting marketing and human resources departments.
- Developed and implemented Ui/Ux standards improving consistency and usability across applications.
- Developed a Content Management System interface with using RESTful Web services.

Senior Software Engineer, Immersive Education Initiative, Boston MA (2008 - 2010).

- Pioneered on-line development and teaching in Internet-based virtual worlds environments.
- Single handedly created Collada → OGRE 3D graphics transcoder -- a C++ module enabling platform-independent representation of 3D learning assets.
- Developed 3D virtual worlds "Collaborative On-line Learning Environments" (COLE's)
- Developed UI components (library browser) on Sun Microsystems Wonderland platform (a java-based system).
- Developed techniques enabling the projection of emotion in 3D avatars
- Collaborated in virtual-worlds research and development at U-Aizu, Japan
- Conducted several International Events to promote and educate the public about Immersive Education

Software Engineer (contractor), Harvard Business School Publishing, Boston MA (2007 - 2008).

- Developed Javascript/XML/XSLT driven system for the presentation of Harvard Business Review (HBR) assets creating a workflow for product creation.
- Implemented javascript modules integrating HBR assets with Learning Management Systems.
- Developed flash UI actionscript components and integrated flash video presentations.

Educational Systems Specialist, Altova, Beverly, MA (2004 - 2007).

- Developed infrastructure and content for live, world-wide, web-based training for xml-related technologies.
- Created an XML/XSLT driven system enabling independent content development for web-based presentations.
- Developed MS SQL database and SQL queries handling session enrollments for thousands of customers world-wide.

Lecturer (part-time), Boston College, Newton MA (2003 - 2010).

- Developed and taught; *Exploring Internet Development*.
- Created a custom system to generate and present on-line materials and resources supporting on-site and distance learning.
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Java Instructor, Sun Microsystems, Burlington, MA (2000 - 2004).

- Developed and delivered instructional materials on Object Oriented analysis and design.
- Delivered courses in enterprise related technologies including; core Java, JDBC, J2EE, XML, and Web-services.

Visiting Professor, Boston College, Newton MA (1998 - 2000).

- Developed and taught courses in statistics, neural network modeling and cognitive science.

Research Fellow, Boston University School of Medicine, Boston MA (1997 - 1998).

- Designed and conducted sentence-processing research in aphasic populations.
- Conducted research involving signal processing and analysis of the human speech signal

Post-Doctoral Fellow, Massachusetts General Hospital, Boston MA (1995 - 1996).

- Conducted research in natural language processing in normal and neurologically impaired populations.

Post-Doctoral Fellow, University of California, San Diego - Center for Human Information Processing, La Jolla, CA (1994 – 1995).

- Conducted research in human sentence processing contributing to further understanding of the development of computational systems for natural language processing and speech recognition.

EDUCATION

- **Ph.D.** (cognitive science). Florida Atlantic University, Boca Raton, FL (1994). Dissertation: *The Role of Prosody in Sentence Processing*.
- **B.A.** (psychology). University of Massachusetts, Lowell, MA (1989).

LANGUAGES, FRAMEWORKS AND API'S

Programming Languages	OS, Frameworks, and API's	Tools and Software
Python	Linux, Windows, MacOS	GIT (GITHUB)
C++	Tensorflow (for machine learning)	Amazon Web Services (AWS)
Javascript (React/Redux)	numpy, pandas, sci-kit, matplotlib	Visual Studio Code
HTML5	OpenCV	Webstorm
SQL	OpenGL	Inkscape (SVG illustration)
Java	Electron (for desktop applications)	Microsoft Office
XML/XSD/XSLT	Postgres	

AREAS OF EXPERTISE AND INTERESTS

- Machine learning, artificial intelligence, and behavioral simulations
- Computer vision
- 2D and 3D computer graphics and animation
- Virtual environments and virtual worlds development
- Drawing and design
- Languages and linguistics
- Mathematics