

# Karl Nyberg

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## Summary

- Experienced software / systems architect in design, development and deployment of scalable, distributed, fault-tolerant, transaction processing systems on UNIX (Linux, Solaris, AIX) with SQL databases (Oracle, MySQL, VoltDB) using Ada, C/C++, DSD, Java in diverse application domains (banking, air traffic control, operating system computer security, telecommunications, image processing).
- Formal methods of programming languages (parsing, theorem proving, static code analysis), automation, writing / evaluation (requirements, specifications, design, code, documentation)
- Interoperation among programming language (Ada, C/C++, Fortran, Java) standards (CORBA), communications protocols (HTTP, TCP/IP, SMTP, RADIUS, DIAMETER), image / data formats (OFX / IFX, XML, PDF, Postscript, TIFF, ESRI Shapefile, HDF).

## Education

Massachusetts Institute of Technology Cambridge, MA

- Master's degree in Electrical Engineering and Computer Science

Thesis: [A Methodology for Using Algebraic Specifications](#)

- Bachelor's degree in Computer Science and Engineering

Thesis: [An Experiment in Using Algebraic Specifications](#)

Stanford University

(virtual via Coursera)

- [Machine Learning](#)

University of Minnesota

(virtual via Coursera)

- Introduction to Recommender Systems

## Awards

- [ACM SIGAda Ada Community Contributions Award](#), November, 2007
- Sun Microsystems "Open Performance Contest" winner for "[A Constructive Approach to Integer Factorization](#)" January 2007
- [IEEE POSIX Pioneer award](#), March 1988

## Professional

- ACM Senior Member, ACM SIGAda (Baltimore / DC Chair)
- US SC22 JTC1 TAG / ISO IETC J22 - Java Study Group (1997 - 1999)
- Federal Advisory Board on Ada (1990 – 1992)
- Ada 9X Requirements Team (1989 – 1990)
- IEEE Technical Committee Operating Systems P1003.1 (1986 – 1988)

## Certifications

- [COMPTIA Security+ 1159M8QJVC14S5PJ](#), to September 2017

**Experience**      August 1985 – Present      Grebyn Corporation      Sterling, VA

Projects: Local, national and international projects ranging from single day to multi-year efforts covering the entire software lifecycle. Newsletters, CDs and books on Ada. Publications listed below and [Google Scholar](#).

Major Clients: Booz Allen Hamilton, Convergys, CSC, Global Protocols, Inc., Honeywell Federal Systems, IBM, Institute for Defense Analyses, Lockheed Martin, Openet Telecom, SAIC, Telos Corporation, VISA.

May 2018 – Sep. 2018      EPAM Inc      McLean, VA

Senior Software Developer

- Part-time effort for SalesForce. Migrated Formula Engine from ANTLR 2.7 to ANTLR 4.7.1. Development environment was Apple Macintosh with git, maven, ant, Java.

Oct. 2010 – Nov. 2011      HTSI/Defense & Space      Greenbelt, MD

Program Manager 5 (SME) (L)

- Temporary, part-time, on-call support for Near Earth Network Services.

Aug. 2005 – Dec. 2005      Geologics      Alexandria, VA

Ada Software Engineer / Software Auditor

- Part-time software review of En Route Automation Modernization on IBM AIX with OC Systems Ada compiler.

Jan. 1983 – May 1986      Verdix Corporation      Chantilly, VA

Various Senior Technical Positions

- Created initial concept of Verdix Secure Local Area Network (VSLAN).
- Authored winning Small Business Innovation Research (SBIR) Phase I proposal for Network Security Devices (later productized as VSLAN).
- Administered computing facilities and supervised junior staff.
- Verdix Ada Development System (VADS) product development, quality assurance and customer support.

## Publications and Talks

- Nyberg, Karl A. "[Automatically Generating DTD-Specific XML Parsers](#)", ACM SIGAda AdaLetters, August 2010. Also available at <http://www.hdfgroup.org/pubs/others/>.
- Nyberg, Karl A. "[Parsing Hierarchical Data Format \(HDF\) Files](#)", ACM SIGAda AdaLetters, August 2010. Also available at <http://www.hdfgroup.org/pubs/others/>.
- Nyberg, Karl A. "[Multi-Core + Multi-Tasking = Multi-Opportunity?](#)", Proceedings of the ACM SIGAda 2007 conference, Fairfax, VA. November 2007; also ACM SIGAda AdaLetters XXXVII #4, pp. 79-81, December 2007. ([Slides](#))
- Nyberg, Karl A. "[A Constructive Approach to Integer Factorization](#)", an evaluation of the Sun Microsystems SunFire T1000.
- Nyberg, Karl A. "[Fun v. Tedium](#)", Letters to the Editor, *IEEE Software*, p. 9, May/June 2007. (Also available at [IEEE Software](#))
- Ausden, Howard and Nyberg, Karl A. "[Using ASIS to Generate C++ Bindings](#)", Proceedings of the ACM SIGAda 2005 conference, Atlanta, GA. November 2005; also ACM SIGAda AdaLetters XXV #4, pp. 23-30, December 2005. ([Slides](#))
- Nyberg, Karl A. "[Windows Disk Drive Recovery with Ada95 – An Application Note](#)", ACM SIGAda AdaLetters XXV #2, pp. 42-44, June 2005.
- Nyberg, Karl A. "[Optical Character Recognition \(OCR\) of Cryptographic Source Code](#)". ACM Washington, DC Special Interest Group on Ada (SIGAda), McLean, VA. May 8, 2003.
- Nyberg, Karl A. "[Barbarians at the Gate – Stopping Spam in its Tracks](#)", 2001.
- Emery, David E.; Mathis, Robert F.; and Nyberg, Karl A. "[Automating the Ada Binding Process for Java - How Far Can We Go?](#)" Reliable Software Technologies: Proceedings of the Ada Europe 1998 conference, June 1998, Uppsala, Sweden.
- Nyberg, Karl A., (Editor), "The Annotated Ada Reference Manual", Third Edition, March 1994.
- Engle, Charles B., Jr and Nyberg, Karl A. "[Mandating Ada Compiler Evaluation](#)", Invited Paper. Minutes of the Federal Advisory Board on Ada, June 27, 1991. Pittsburgh, PA. ([slides](#))
- Nyberg, Karl A., "Ada: Sources & Resources", Third Edition - April 1991.
- Nyberg, Karl A., "A Study of Ada's Input-Output Packages", SEI Special Report. 1990.
- Nyberg, Karl, "Coming of age in the computer industry", *Journal of Pascal, Ada and Modula-2*, Special Issue: Ada in Action, Volume 9, Issue 3, pp. 58-59. May / June 1990.
- The Ada 9X Revision Requests – Fact & Fantasy. MITRE Corporation, McLean, VA. April 10, 1990.
- Nyberg, Karl, "Vaporware, trust, and the Ada Industry", *Journal of Pascal, Ada and Modula-2*, Volume 9, Issue 1, pp. 56-57. January /

February 1990.

- Nyberg, Karl, "Personal reflections: Ada: ill-at-ease", *Journal of Pascal, Ada and Modula-2*, Volume 8, Issue 2, p. 53. March / April 1989.
- Emery, David and Nyberg, Karl A., "[Observations on Portable Ada Systems](#)", in "Ada: The Design Choice", Proceedings of the Ada-Europe International Conference, Madrid, Spain, 13-15 June 1989. Cambridge University Press. Also MITRE Technical Paper MTP-282; February 1989, Bedford, MA. ([slides](#))
- Nyberg, Karl and Udell, Jon, "IntegrAda : An Ada Programming Support Environment for the PC", *Byte*, Vol. 14, Number 1, pp. 213-220, January 1989.
- Nyberg, Karl A., "[Denial of Service Flaws in SDI Software: An Initial Assessment](#)", Proceedings of the Fourth Aerospace Computer Security Applications Conference, December 12-16, 1988, Orlando, FL.
- Donaldson, Albert L.; McHugh, John; Nyberg, Karl A., "[Covert Channels in Trusted LANs](#)", The 11th NBS/NCSC National Computer Security Conference, pp. 226 – 232. October 17-20, 1988, Baltimore, MD.
- Nyberg, Karl A. "The Application of Formal Methods to Ada Software Development". ACM SIGAda, Phoenix, AZ. March 24, 1988.
- Preston, David; Nyberg, Karl A.; Mathis, Robert. "[An Investigation Into the Compatibility of Ada and Formal Verification Technology](#)", 6<sup>th</sup> National Conference on Ada Technology: Ada in the Life Cycle, March 14-17, 1988, Arlington, VA ([extended abstract](#)).
- Nyberg, Karl A. "Porting Ada Applications between a PC and a VAX". Capital Area PC Users Group (CPCUG) Ada Special Interest Group, Bethesda, MD. February 15, 1988.
- Lee, JAN and Nyberg, Karl A., "[Strategies for Introducing Formal Methods Into the Ada Life Cycle](#)", SPC-TR-88-002, Version 1.0. Software Productivity Consortium, January 1988, Reston, VA. Also [Virginia Tech - CS TR-88-09](#).
- Nyberg, Karl A. "[Using Representation Clauses as an Operating System Interface](#)", *Ada Letters*, Volume VII, Number 4, July - August, 1987; pp. 98-101.
- Nyberg, Karl A., "[Implementing Curses in Ada](#)", Proceedings of the 1986 USENIX Winter Conference, January 1986, Denver, CO.
- McHugh, John and Nyberg, Karl A., "[Adapting the Gypsy Verification System to Ada](#)", in Proceedings of the First IDA Workshop on Formal Specification and Verification of Ada, Clyde G. Roby, ed., Memorandum Report #M-146, December 1985, Alexandria, VA. ([slides](#))
- McHugh, John and Nyberg, Karl A., "[Ada Verification Using Existing Tools](#)", IEEE Software Engineering Notes, V 10, no 4. Special Issue: Proceedings of Verkshop III, pp. 104-106. August 1985
- Nyberg, Karl A.; Hook, Audrey A.; Kramer, Jack F., "[The Status of Verification Technology for the Ada Language](#)", IDA Paper #P-1859, July 1985, Alexandria, VA.
- Nyberg, Karl A.; "[A Methodology for Using Algebraic Specifications](#)",

Master's Thesis, Massachusetts Institute of Technology, June 1981.  
Cambridge, MA.

- Nyberg, Karl A.; "[An Experiment Using Algebraic Specifications](#)",  
Bachelor's Thesis, Massachusetts Institute of Technology, August 1980.  
Cambridge, MA.