

Luanne Burns
2908 Estates Drive
Virginia Beach, VA 23454
757-639-3969
luannebg@yahoo.com

Education

Columbia University: New York, NY (September 1987-May 1993) **Ph.D. Educational Psychology, M.Phil. Educational Psychology.** Human/computer interfaces, direct manipulation interfaces; artificial intelligence, including expert systems, neural networks, natural language processing, and database systems. Dissertation work on automatic debugging of procedural errors in children's arithmetic problems. An expert system used in conjunction with a "paper-like" interface (flat tablet with electronic pen and ink) monitors the student as s/he performs arithmetic procedures; handwritten marks are used as clues to the student's intentions. The sequence and timing of written gestures is recorded. A neural network is used for digit recognition. The system provides various forms of interactive and immediate feedback incorporating voice and animation. Thesis advisors: Herb Ginsburg, John Black. GPA 3.95/4.0.

Abstract: <http://thewebmaestra.com/abstract.html>

Video: <http://thewebmaestra.com/meadow.wmv>

Full text: <http://thewebmaestra.com/meadow.pdf>

Columbia University: New York, NY (September 1984-August 1986) **M.S. Computer Science.** Involved in the research and development of an SQL implementation on *DADO*, a tree-structured parallel computer designed for the high speed execution of production systems. Designed and implemented DTEX/DB, a generic database interface for the DTEX expert system development environment. Designed and implemented a production system environment for selecting a solution to inverse kinematics problems of a PUMA robot. Completed courses in various fields of artificial intelligence, software engineering, database systems, natural language processing, and robotics. GPA 3.95/4.0.

Rochester Institute of Technology: Rochester, NY (September 1981-May 1984) **B.S. Computer Science.** GPA 3.97/4.0.

Work Experience

Johns Hopkins University Applied Physics Lab: Laurel, MD (May 2009- present)
Top Secret Security Clearance

Cyber Warfare, Applied Information Sciences Department. Working on various projects including the organization of a workshop on *Computational Cyberdefense in Compromised Environments* for the Office of Director of National Intelligence and National Security Agency, the National Information

Assurance Engagement Center (NIAEC), and the Linux Kernel Integrity Model (LKIM) front-end, KAFE (Kernel Analysis Front End).

Carnegie Mellon University: Pittsburgh, PA (May 2006-May 2009)
Top Secret Security Clearance

The Carnegie Mellon Software Engineering Institute (SEI) is a federally funded research and development center. The SEI staff has advanced software engineering principles and practices in software engineering, computer security, and process improvement.

Function Extraction (FX) is a disruptive new technology that will substantially improve the economics of software development and increase the dependability of software systems. Function Extraction applies mathematical foundations to automate calculation of the behavior of software, the objective being to replace slow and fallible manual methods of code reading and inspection with fast and correct computation of behavior. Main focus of contribution to FX was in the user interface, database repository and video production. Developed the user interface using Java/Swing and web-based front end components using Javascript, PHP, and MySQL. Several views of behavior catalogs are presented to the user in tabbed format. <http://functionextraction.info/fxlong.wmv>

Network Situational Awareness (NetSA) iSiLK Configuration Editor The CERT/NetSA has developed and maintains a suite of open source tools for monitoring large-scale networks using flow data. The System for Internet Level Knowledge (SiLK) is an efficient network flow collection and storage infrastructure that will accept flow data from a variety of sensors. SiLK also provides a suite of efficient command-line tools for analysis. iSiLK is a graphical front-end for the SiLK tools, designed to work with an existing installation of the SiLK analysis suite. Contribution to iSiLK was the Configuration Editor written in Python. <http://thewebmaestra.com/isilk.html>

Future Combat System (FCS) Parameterized Product Integration Model (PPIM) facilitate the design, development and implementation of a Parameterized Product Integration Model (PPIM) to facilitate the management of FCS software product delivery and integration efforts. Primary contribution was work on redesign and implementation including database schema and new interface in Adobe Flex Builder 3, ColdFusion, and SQL Server <http://thewebmaestra.com/ppim.jpg>

The WebMaestra: Virginia Beach, VA (January 2003-present) Sole-proprietorship of web business (<http://thewebmaestra.com>) where I develop websites both businesses, non-profits, and charities <http://thewebmaestra.com/portfolio.html>

ECPI College of Technology: Virginia Beach, VA (January 2002-May 2006)
Computer Science Instructor. Courses taught include Systems Analysis, Logic, Introduction to Programming, Java Programming, Visual Basic, C Programming. Developed bi-lingual (C and Java) curriculum for introductory programming course; also developed entirely new Java course. Used team-approach to teaching and learning in Systems Analysis course. ECPI (www.ecpi.edu) is a local technical college with a rigorous, fast-paced Associates Degree program. Terms are 5 weeks in duration, where students take two courses per term, 5 hours per day per course, 2 days per week per course. They receive their A.A.S. degree in approximately 14-15 months and B.S degree in 2.5 years.

International Business Machines Corporation: Yorktown Heights, NY.

May 2000-September 2001

Java development of Page Analyzer Viewer, a GUI showing web page performance decomposition in real time. Provides performance data analysis in tabular, and graphic views, as well as allowing comparative analysis of modeled performance data. Extensive use of complex JFC/Swing components to achieve intuitive access to very detailed information relating to browser / web server communications activities. This product shipped in 12/02 as the Tivoli Manger for Transaction Performance (TMTP). <http://thewebmaestra.com/pageanalyzerviewer.html>

May 1999-May 2000 - Visual C++ development of Network Event Browser, a graphical user interface for network performance analysis. Various statistical plots and pictures are provided for viewing logged data pertaining to network events. This tool allows network administrators to browse easily through the data to determine bottlenecks, patterns, problem areas, and potential security risks. <http://thewebmaestra.com/eventbrowser.html>

March 1998-May 1999 - Java development of Parentage, a graphical user interface to the search engine of the Florida Center for Library Automation's digital library system. Instead of presenting search results as a linear list, Parentage presents three graphical layers; the first is a top-level view presenting Classifications of documents retrieved. The second level zooms to Clusters within a Classification and finally, the last level displays Documents within Clusters. This allows the user to distinguish between search results by clustering like-documents. Technical skills included Java, JavaScript, and HTML. <http://thewebmaestra.com/parentage.pdf>

May 1997-March 1998 - Java development of user interface for 1998 Nagano Winter Olympic score correction system. The OSCAR (Olympic Score Correction And Repository) applet was developed to allow IBM's quality control team to correct scores before reporting the World Press database system so that the Olympic web site was kept accurate and current.

OSCAR allowed the editor to browse score pages, correct erroneous scores using a WYSIWYG editor, and publish them to 13 sites across the world. Also developed prototype Olympic medal watcher using PUSH technology; NAOMI (Nagano Olympic Medal Watcher) allowed the user to specify which countries/sports s/he was interested in and, as new medals were won, data was pushed out from a router applet. This eliminated the need for the user to poll for changes. Java, JavaScript, HTML and C/C++. <http://thewebmaestra.com/nagano.html>

June 1995-May 1997 - Development of IBM's Authentic Assessment Tool for IBM K-12 education. This tool was developed to assist teachers in scoring, collecting, tracking, and displaying students' work online. General Availability was July, 1996. This tool is part of the IBM SchoolVista Assessment Suite. It can run stand-alone on Windows 3.1 or Windows 95 or as part of SchoolVista on Windows 95. Skills involved were Visual Basic, Microsoft Access, and C. <http://thewebmaestra.com/aat.html>

September 1991-June 1995 - Manager of Database Visualization project involving the research and development of GARP (Graphical Access to Relational Products), a portable, graphical interface to relational database managers. The product was sold as Visualizer Ultimedia Query, available 8/94. This product was developed in C and Presentation Manager. <http://thewebmaestra.com/ultimedia.jpg>

Also led design and development of MEADOW (Mathematics, Errors, and Automatic Debugging Of Written input), a tool for automatically diagnosing procedural errors in children's arithmetic. A flat-tablet and electronic ink is used for input because it is a familiar medium for children; a neural network is used for character recognition and an expert system is used for bug diagnosis. The system runs on an IBM PS/2 under OS/2 and PM. Skills involved included C, C++, neural networks, OPS5, and expert systems. <http://thewebmaestra.com/meadow.wmv>

January 1986-January 1991 - Implemented ERBrowser, the first prototype for Database Visualization product, in Smalltalk under DOS. Later, became the chief developer of RM Graph, a graphic interface to IBM's Repository Manager. Both ERBrowser and RM Graph were interfaces for Entity-Relationship databases. Also designed and implemented the graphical relational database interface for Personal AS/OfficeVision. These interfaces were developed to eliminate, or greatly reduce, the need for users to access databases using the formal syntax of a query language. The ERBrowser prototype and the RM Graph and Personal AS products were earlier steps in the evolution of Visualizer Ultimedia Query. Skills involved were Smalltalk, C, Windows, Presentation Manager, SQL,

and C++. <http://thewebmaestra.com/erbrowserpic.jpg>
<http://thewebmaestra.com/garp.jpg>
<http://thewebmaestra.com/ultimedia.jpg>

June 1984-January 1986 - Involved in the development of EAS-E (Entities, Attributes, Sets), an integrated development and database environment.

Rochester Institute of Technology: Rochester, NY (September 1983-May 1984)
Consultant and laboratory assistant for VMS and UNIX operating systems running on VAX-11/780 machines.

International Business Machines Corporation: Kingston, NY (March 1983-September 1983) Data Systems analysis -- performance and assurance. Developed APL routines to serve as predictive models of new products.

Eastman Kodak Company: Rochester, NY (March 1982-September 1982) Developed and maintained FORTRAN and PL/1 systems for film manufacturing and management budget reports.

Computer Programming Skills Summary

Java, JavaScript, PHP, Python, Coldfusion, HTML, C, C++, Adobe FlexBuilder
MySQL, SQL, ASP, SQL Server, Visual Basic, MS Access, Adobe Photoshop,
Adobe Audition, Adobe Premiere, Adobe InDesign, Smalltalk, OPS5, LISP,
FORTRAN, COBOL, Pascal, APL.

Publications

Daly, T., Burns, L., *Concurrent Architecture for Automated Malware Classification*.
Proceedings of Hawaii International Conference on System Sciences, Kauai, Hawaii,
January, 2010.

Burns, L., Daly, T., *FXplorer: Exploration of Software Behavior A New Approach to
Code Understanding and Verification, Function Extraction for Computation of Software
Behavior*. Proceedings of Hawaii International Conference on System Sciences, Kona,
Hawaii, January, 2009.

Burns, L., *FExplorer: Exploration of Software Behavior with Function Extraction
Technology*, CERT STAR*Lab, Carnegie-Mellon University, Software Engineering
Institute, 2007.

Burns, L., Linger, R., *Function Extraction Technology: Toward Next Generation Software Engineering*, video script, editing, production, CERT STAR*Lab, Carnegie-Mellon University, Software Engineering Institute, 2007.

Bartholomew, R., Burns, L., Daly, T., Linger, R., Prowell, S., *Function Extraction: Automated Behavior Computation for Aerospace Software Verification and Certification*, American Institute of Aeronautics and Astronautics, Sonoma, CA 2007.

Linger, R., Burns, L., Daly, T., Pleszkoch, M., Prowell, S., Sayre, K., Walton, G, *Function Extraction Invention Disclosure*, 2007.

Linger, R., Pleszkoch, M., Burns, L., *Reducing Risk and Cost in DoD Systems: Computing Software Behavior with Function Extraction Technology*. National Defense Industrial Association (NDIA) poster session, Charleston, SC, 2007.

Linger, R., Burns, L., Hevner, A., Walton, G., *Next-Generation Software Engineering: Function Extraction for Computation of Software Behavior*. Proceedings of Hawaii International Conference on System Sciences, Kona, Hawaii, January, 2007.

Burns, L., *Online Video Lectures in Programming Logic – Adding a “Virtual Human” to Enhance Online Education*, September 2003.

Burns, L., Merchant, W., *Bilingual Novice Programmers – Not a Contradiction in Terms*, in process, September 2003. A report of experimental Introduction to Programming classes taught in both Java and C.

Burns, L., *Faculty Assessment – Pedagogy, Content, Process, Engagement*, August 2003. Special report submitted to ECPI College of Technology.

Burns, L., *Ordinary Mom Finds Homeschooling Extraordinary*, May 2003. Submitted to *Parent’s Magazine* and *Homeschool Educators Association of Virginia*.
<http://thewebmaestra.com/GoldrichHomeschoolArticle.pdf>

Burns, L., *The First Programmer was a Woman: Women in Technological Collegiate Programs*. June 2002. A childcare services survey submitted to ECPI College of Technology.

Burns, L., *Student Teaching Teams to Promote Learning* . June 2002. ECPI College of Technology.

Burns, L.M., Hellerstein, J.L. Ma, S., Perng, C.S., Rabenhorst, D.A., Taylor, D., *Towards Discovery of Event Correlation Rules* . IBM Thomas J. Watson Research Center, Yorktown Heights, NY. International Symposium on Integrated Network Management, May, 2001, Seattle, Washington.

Burns, L., Hellerstein, J.L., Ma, S., Perng, C.S, Rabenhorst, D.A., Taylor, D., *System and Method for Systematic Construction of Correlation Rules*, US. Patent, filed May 2001.

Burns, L.M., Perkins, S.C., Orth, D., (1993), *A Neural Network Approach to Automatic Recognition of Children's Handwriting*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY. *Journal of Artificial Intelligence in Education*, 1994.

Burns, L.M., Ginsburg, H.P., Black, J.B., Perkins, S.C., Gordin, D.N., (1993) *An Expert System and Pen Interface for Debugging and Intelligent Tutoring of Children's Mathematics*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY.

Burns, L.M., Ginsburg, H.P., Black, J.B., (1993) *A Comparative Study and Micro genetic Analysis of Student-based and Domain-based Feedback in Children's Mathematics*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY.

Burns, L.M., (1993) *MEADOW*. Videotape presented at Multimedia 1993, Anaheim, CA, August 1993, as part of SIGGRAPH conference.

Burns, L.M., Perkins, S.C., Shimmin, E., Sockut, G., (1993) *The Database According to GARP: Graphical Access to Relational Products*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY, IBM Warwick Software Development Laboratory, Warwick England, and IBM Santa Teresa Laboratory, San Jose, CA.

Burns, L.M., Pazel, D.P., (1993) *A Genetic Algorithm for Graph Layout of Relational Database Tables in a Graphical User Interface*, IBM Thomas J. Watson Research Center, Yorktown Heights, NY.

Kanevsky, D., Bellegarda, J.R., Burns, L.M., Zadrozny, W.W., (1993) *Improving Handwriting Ability via Automatic Handwriting Recognition*. IBM Technical Invention Disclosure Bulletin Vol. 36, No. 2, February 1993. Disclosure number Y0892-0253.

Malhotra, A., Burns, L.M., (1993) *Intelligent Query: Natural Language + Graphical Query + Learning*. IBM Thomas J. Watson Reserach Center, Yorktown Heights, NY.

Socket, G., Burns, L., Malhotraa, A., Whang, K-Y., (1993) *GRAQULA: A Graphical Query Language for Entity-Relationship or Relational Databases*, *Data and Knowledge Engineering*, North-Holland, Amsterdam, Netherlands, Vol. 11, No. 2, Oct. 1993, pp. 171-202; more details appear in Research Report RC 16877, IBM Thomas J. Watson Research Center, Yorktown Heights, NY March, 1991.

Whang, K-Y., Burns, L., Malhotra, A., Socket, G., (1992) *Two-dimensional Specification of Database Queries*. *IEEE Transactions on Software Engineering*, March 1992, Volume 18, No. 3.

Burns, L.M., (1991) *MEADOW -- Mathematics, Errors, and Automatic Debugging of Written input*. Invited paper, National Educational Computing Conference, Phoenix, Arizona, June, 1991. Also, IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 16736, April, 1991.

Malhotra, A., Burns, L.M., Sockut, G.H. and Whang, K-Y., (1991) *IRIS: An Interactive Database Facility*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 16945, June, 1991.

Burns, L., Malhotra, A., Sockut, G, Whang, K-Y., (1991) *AERIAL -- Ad hoc Entity-Relationship Investigation and Learning*. Journal of Man-Machine Studies 38, pp. 607-623, May 1993. Also, IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 16186, October, 1990.

Burns, L., Malhotra, A., Sockut, G., Whang, K-Y., (1991) *Investigation and Learning in Entity-Relationship Databases*. Proceedings of International Conference on Systems, Man, and Cybernetics, October, 1991.

Burns, L., Malhotra, A., Black, J., (1990) *Is a Picture Worth a Thousand Queries?* IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 16172, October, 1990.

Burns, L.M., Ginsburg, H., (1990) *The Case of the Missing 5*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY and Columbia University Teachers College, New York, NY.

Burns, L., (1990) *A Computer Assisted Method for Analyzing Arithmetic Problem Solving*. IBM Invention Disclosure number Y0990-174, filed.

Burns, L., Malhotra, A., Demion S., (1990) *Graphical Query Facility for a Relational Database*. IBM Technical Invention Disclosure Bulletin, Vol. 33, No. 7, December 1990. Disclosure number Y0889-0190.

Burns, L., Demion, S., Malhotra, A., (1990) *Displaying Path Information in a Graphical Browsing Facility*. IBM Technical Invention Disclosure Bulletin, Vol. 33, No. 7, December 1990. Disclosure number Y0890-0229.

Burns, L., Malhotra, A., (1990) *Browsing: A Novel Facility for Exploring the Contents of a Datastore*. IBM Technical Invention Disclosure Bulletin, Vol. 33, No. 7, December 1990. Disclosure number Y0890-0191.

Burns, L., Malhotra, A., (1990) *Intelligent Query*. IBM Invention Disclosure Y0890-0848, filed. Patent number 5,454,106, September 26, 1995.

Whang, K-Y., Malhotra, A., Sockut, G., Burns, L. (1990) *Supporting Universal Quantification in a Two-dimensional Database Query Language*. Proceedings of Sixth

International Conference on Data Engineering, Los Angeles, California, February, 1990 (Outstanding Paper Award). Also, IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 14402, February, 1989.

Burns, L., Darwen H., Shimmin E., (1989) *A Visual Representation of Database Query Definition*. IBM Technical Invention Disclosure Bulletin, Vol. 33, No. 9, February, 1991. Disclosure number UK8-89-109.

Malhotra, A., Markowitz, H., Tsalalikhin, Y., Pazel, D., Burns, L. (1989) *An Entity-Relationship Programming Language*. IEEE Transactions on Software Engineering, Vol. 15, No. 9, September, 1989. Also, IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 11816, April, 1986.

Burns, L., Archibald, J., and Malhotra, A. (1987) *A Graphical Entity-Relationship Database Browser*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Videotape presented at *Object-Oriented Programming Systems, Languages and Applications (OOPSLA '87)*, October, 1987, Orlando, Florida.

Burns, L., Archibald, J., and Malhotra, A. (1987) *A Graphical Entity-Relationship Database Browser*. Proceedings of Hawaii International Conference on System Sciences, Kona, Hawaii, January, 1988.

Burns, L., and Krzyzanowski, P. (1986) *Production System Application to Inverse Kinematics of PUMA Robot*. Proceedings of Hawaii International Conference on System Sciences, Kona, Hawaii, January, 1987.

Burns, L.M. and Pasik, A. (1985) *A Generic Framework for Expert Data Analysis Systems*. Technical Report, Department of Computer Science, Columbia University, New York, NY.

Markowitz, H.M., Malhotra, A., Burns, L.M., Pazel, D.P., Tsalalikhin, Y. (1985) *The EAS-E Application Development System: A Primer*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY.

Stolfo, Salvatore J., Burns, Luanne (1985) *DQL: A Subset of SQL on the DADO Machine*. Department of Computer Science, Columbia University, New York, NY.

Malhotra, A., Pazel, D.P., Burns, L.M. (1984) *BROWSER: A Visual, Interactive Database Interface*. IBM Thomas J. Watson Research Center, Yorktown Heights, NY. Research report RC 10964, January, 1985.

Honors and Awards

Nominated Best Paper Hawaii International Conference on System Sciences (HICSS-43), January, 2010

Premier Who's Who 2010
Track Chair HICSS-43
Nominated "Most Able to Inspire Others to Act," Lead Hampton Roads Class of 2009
Selected as member of Lead Hampton Roads Class of 2009
Phi Theta Kappa International Advisor Paragon Award, 2006
Outstanding Phi Theta Kappa Advisor Award, 2006
Virginia Region Phi Theta Kappa Horizon Award, 2006
Virginia Region Phi Theta Kappa Horizon Award, 2005
Nominated for Virginia's Outstanding Faculty Award, 2003-2005
Who's Who Among America's Teachers, 2004, 2005
IBM Patent Invention Achievement Award for "*System and Method for Systematic Construction of Correlation Rules*", May, 2001
Strathmore's Who's Who Registry of Business Leaders, 1997
Research Division Award for IBM Authentic Assessment Tool, May, 1996
Kappa Chapter of Sigma, Xi, Scientific Research Honor Society, 1994
IBM Patent Invention Achievement Award for "Intelligent Query", July, 1993
Invited paper at National Educational Computing Conference, Phoenix, Arizona, June, 1991
IBM Patent Invention Achievement Award for "A Computer Assisted Method for Analyzing Arithmetic Problem Solving"
Outstanding Paper Award, Sixth International Conference on Data Engineering, February, 1990
IBM Research Division Award for Repository Manager graphical interface, 1988
Artificial Intelligence Session Coordinator for Hawaii International Conference on System Science-21 (HICSS-21), January, 1988
Nominee best paper award, HICSS-21
Knowledge-based systems panel member, HICSS-21
User-interface panel member, HICSS-21
Referee for HICSS-21 conference
Referee for Journal of Man-Machine Studies
Referee for IEEE Software Magazine
Alpha Sigma Lambda Honorary Society
RIT Outstanding Scholar Award
Merit Tuition Award
Kodak Scholar – full scholarship to RIT, [speech that won the award](#), 1981
Citizen's Committee Scholar