**Terry G. Glagowski, Ph.D.**

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WWW: http://www.glagowski.org (home)

**Career Objective:**

I am semi-retired and no longer pursuing full-time, on-site, daily positions.

My goal is for consulting, telecommuting, part time work that does NOT require relocation or a long daily commute.

Some travel is OK according to job requirements.

**Summary:**

Extensive experience in systems engineering, requirements engineering, software engineering, embedded systems engineering, VLSI chip and system design, information systems, CAD / CASE tools, and environments for engineering of systems. Recent experience in C2 / C4ISR, Radar Systems, CNS/ATM NEXTGEN Navigation for military and civilian government, data acquisition, robot servo motion control, digital television, video, and home entertainment applications. Experience in university / industry collaboration, technology transfer, and teaching of computer science and engineering subjects. Volunteer experience in HF and VHF radio communications to support the Air Force Military Auxiliary Radio Service (AFMARS) for 35 years, including software development for HF/VHF Radio Systems. Former INTERIM TOP SECRET clearance (GTE Govt. Systems), current ACTIVE SECRET clearance (Jacobs Technology).

**Education:**

Ph.D. University of Connecticut (computer science)

MSEE Stanford University (Bell Labs One Year On Campus fellowship program)

BSEE University of Connecticut (Magna Cum Laude)

**Experience:**

**Jan 2015 – Aug 2019: University of Connecticut, Storrs, CT 06269**

***Adjunct Professor: Computer Science and Engineering (CSE) – UTC Institute for Advanced Systems Engr.***

Instructor for SE 5301 – Embedded / Networked Systems Modeling Abstractions

Instructor for CSE 3000 – Contemporary Issues in Computer Science and Engineering

Instructor for CSE 2500 – Introduction to Discrete Systems

**Jan 2015 – present: Consultant for Palstar, Inc., Piqua, OH 45356**

***Software / Firmware / Hardware / Systems Engineer***

Provide assistance with radio equipment design and manufacturing.

**Feb 2008 – May 2015: Jacobs Technology, 55 Old Bedford Rd, Lincoln, MA (retired)**

***Senior Systems Engineer, Aerospace Management Systems Div., Global Air Traffic Systems (CNS/ATM)***

Currently assigned to ESC/HBAI (CNS/ATM) navigation branch. Duties include performing Type-1 audits of navigation data quality assurance at National Geospatial Intelligence Agency (NGA) and Type-2 audits of TASM software module for the Mission Planning System (JMPS/MPS) flight planning system. DAFIF Navigation data chain quality assurance is audited to meet RTCA DO-200, DO-201, and DO-178B requirements for flight safety and navigation precision of long range USAF aircraft. Duties also include planning for future NEXTGEN navigation systems to be introduced over the next two decades by USAF, FAA, ICAO, and other civil aviation authorities. Recently this has involved the development of a software tool to automatically validate the DAFIF Product Specification documents for consistency, and to validate the DAFIF Navigation Database against the product specifications using database and compiler technology built in MS Access VBA. Also a member of the CNS/ATM audit team for RTCA DO-200A and FAA AC-20-153 compliance on the part of Type 1 navigation data suppliers (National GeoSpatial Intelligence Agency) and Type 2 data packers (aircraft FMS software developers)

***Senior Engineer, Space Control Sensors Division***

Same as below, company change due to contract re-bid and turnover. See [www.jacobstechnology.com/etass/](http://www.jacobstechnology.com/etass/)

**2003 – Feb 2008: Titan / L-3 / Engility Corporation, 300 Concord Road, Billerica, MA**

**Note: Titan Corp was acquired by L-3 Communications in 2005 and become L-3 Engility Division**

***Senior Systems Engineer, Space Control Sensors Division***

Assigned to ESC/HSIJ Eglin FPS-85 RADAR Service Life Extension Program (SLEP). The FPS-85 is the world’s most powerful deep-space surveillance radar located in NW Florida. Performed review of requirements, design, test plan documents, and performed on-site monitoring of contractor system integration and testing. Also monitoring of schedule, earned-value management (EVM), information assurance (DoD DIACAP 8500 network security), and overall DoD 5000.02 acquisition procedures followed by the contractor. The upgraded components are a combination of embedded hardware and software involving real-time JAVA and VXworks C/C++ custom embedded and RF hardware / firmware using VHDL. Development is done using OOA/OOD/UML methodology and disciplined software development, integration, and testing.

***Senior Systems Engineer, Space Control Sensors Division***

Assigned to ESC/HSIB AFSSS S-Band Radar (Space Fence) as a Systems Engineer for Radar Hardware and Software Requirements Development and Analysis. Performed analysis to create the initial program office technical requirements baseline, and initial program office estimate of cost and schedule. Created and operated the requirements database using RTM, MS Access, and IBM/Telelogic DOORS to establish traceability between the MAJCOM requirements document, the systems requirement document, and test plans.

***Senior Systems Engineer, Mission Planning Systems Division***

Assigned to the ITSP engineering support for the MPEC JMPS Mission Planning system (ESC/MPSG) contract for Air Mobility Command (AMC) projects. Technical lead for CNS/ATM RTCA DO-178B compliant navigation, and Tankers, Airlift, Special Missions (TASM) delivery orders (DO), technical lead for the Mission Planning Central (MPC) IPT database using Sharepoint, Technical resource for Global Mission Planning (GMP), Global Planning CC DO, and Mission Planning Central (MPC) web site using MS SharePoint. Performed review of requirements and contractor development procedures that adhered to RTCA DO-178 requirements for precision navigation (CNS/ATM).

***Software Systems Architect / Design Engineer, Air Traffic Systems Division***

Established and managed multi-site computer complexes for acquiring and processing data from sensors for airport surveillance deployed at domestic commercial airports to gather research data for aircraft wake turbulence for the US DOT FAA. (Volpe Center) Developed systems and custom software to perform necessary data acquisition, database integration, data archival, data analysis, network comm., and remote SysAdmin.

Electronics Systems Engineer. See <http://www.titan.com> and <http://www.engilitycorp.com/>

**May 2000 – July 2002: Integrated Dynamics Engineering, 68 Mazzeo Dr., Randolph, MA 02368**

***Senior Software Engineer / Software Group Leader, Robotic & Embedded Systems***

Developed WinNT robot system control applications and embedded firmware (TMS320Cxx) control logic for materials handling robots used in semiconductor manufacturing. Managed and operated the company’s computing infrastructure (Ethernet LAN, Internet WAN, EMail, WEB, System Administration). Participated in product planning (software requirements) and managed full-time and consultant / contract personnel. See [www.ideworld.com](http://www.ideworld.com) .

**Dec 1999-Mar 2000: Invenio Technologies Inc, 699 Boylston Street, Boston, MA**

***Senior Developer, NAPIER Open Sensor Infrastructure***

Developed the overall architecture and system design for the next generation NAPIER Open Sensor Infrastructure, an IT system / Business-to-Business E-Commerce system monitor and control tool to maximize B2B system reliability and efficiency. See [www.invenio.com](http://www.invenio.com) . (note: company is now bankrupt)

**Jan-Nov 1999: Quadrant Software, PO Box 200, Mansfield, MA (Myles Standish Park, Taunton)**

***Principal Software Engineer, FastFax / LAN Processor***

Developed the Fax Manager component of the Fast Fax / LAN product. Fax Manager is a large scale multithreaded FAX send and receive server using single line Class 1 FAX modem cards, multi-line Class 2 FAX modem cards, advanced Gamma and Brooktrout DSP FAX cards, and T1 trunk interface cards. Fax Manager also interfaces to IBM AS/400 using ODBC and SyBase with SQL Anywhere. See [www.quadrantsoftware.com](http://www.quadrantsoftware.com)

**1998-1999: VenturCom Inc, 5 Cambridge Center, Cambridge, MA**

***Principal Software Engineer, RTX Project***

Developed the Hardware Abstraction Layer (HAL) environment for Windows NT 4.0 to support the multiprocessor (SMP) version of the VenturCom real-time extension product (RTX/RTSS). Used assembly language and C, and the Microsoft Platform SDK / DDK for Windows NT kernel level programming.

See [www.vci.com](http://www.vci.com) . (note: company now known as Ardence / Citrix)

**1997-1998: LG Electronics Research Center of America, 40 Washington Rd, Princeton Jct, NJ**

***Member of Technical Staff, Systems Department (LGERCA is now Triveni Digital)***

Developed a test generator tool for Advanced Television Standards Committee (ATSC) Transport Stream Program and System Information Protocol (PSIP) bitstreams for High Definition Television (HDTV) receivers. Represented LGERCA at ATSC T3 / S13, S16, S8 standards committee meetings. Developed embedded system (OS-9 PPC 860 / JAVA, VxWorks) and Windows NT based technology prototypes of a Digital Video Recorder and Home LAN system for High Definition Digital TV. Established the methodology, toolset, and computing infrastructure to be used for development particularly Java, Visual C/C++, object oriented notation, and Rational Rose, and provided training. Developed the corporate external internet WEB site, and intranet capability using FrontPage / Perl and Microsoft IIS for local document indexing and database access. See [www.TriveniDigital.com](http://www.TriveniDigital.com).

**1996-1997: Bose Corporation, The Mountain, Framingham, MA**

***Senior Engineer, Embedded Systems Software, Electronic Products Division***

Developed the real-time operating system (RTOS) and user interface for the next generation Bose LifeStyle 50 ™ series home entertainment product containing several Toshiba TLCS870 series microprocessors and wireless proprietary LAN. Established the system development environment suite of software tools and operating practices used to carry out the project. Created a Microsoft Windows based user interface simulator tool to evaluate user interface strategies and product requirements. See [www.bose.com](http://www.bose.com) .

**1989-1996: Washington State University, Electrical Engineering & Computer Science**

***Assistant Professor, Spokane Branch Campus, and Visiting Professor, Pullman Campus,
Director: Embedded Systems Laboratory at Spokane Intercollegiate Research Technology Institute (SIRTI)***

Directed research in automation of the design methodology for analog/digital circuits using fuzzy query to clasify and retrieve reusable circuit designs, and machine learning artificial intelligence techniques to reengineer circuits. Taught senior and graduate level courses in software engineering, database systems, microprocessors, computer architecture, and Microsoft Windows application development using Visual C++ and MFC. Extensive experience teaching in a video conferenced / multimedia studio classroom environment.

Developed a design reuse tool (Circuit Design Retrieval System - CDRS) to help find reusable design elements from a large repository using a fuzzy query search engine. Developed a commercially available LAN computer aided design tool (Channel Calculator - ChCalc) for Kreager Associates (KAI) of Pullman, WA.

See [www.wsu.edu](http://www.wsu.edu), [www.eecs.wsu.edu](http://www.eecs.wsu.edu), [www.sirti.org](http://www.sirti.org) .

**1978-1989: GTE Laboratories, Inc. (GTE is now Verizon)**

GTE Laboratories, 40 Sylvan Rd, Waltham, MA, and GTE Government Systems, WIS Div. Billerica, MA

***Senior Member of Technical Staff, Network Engineering Department, GTE Govt. Systems
(note: GTE Govt. Systems is now a part of General Dynamics)***

Developed Information Engineering Methodology, CASE toolset, and in-house training course for USAF Software Projects, including AFC2S (Air Force Command Control System). Top Secret clearance.

***Senior Member of Technical Staff, Computer Science Laboratory, GTE Laboratories***

Supervised and carried out research and development programs for software engineering, real-time embedded systems, VLSI design, and telephone switching systems. Systems developed include Generic Business Modeling System - a tool to semi-automatically create information architecture and database schema using an expert system approach, an advanced high level language direct execution microcomputer CPU architecture and VLSI chip, Modular Electronic Control Assembly - a high level language electronic programmable controller, a real-time systems requirements modeling language RTRL, an automated software testing tool ATE for telephone exchanges.

See [www.gte.com](http://www.gte.com)

***Visiting Exchange Professor from GTE Labs to University of Puerto Rico, Mayaguez, PR.***

Carried out corporation / university public relations and technology transfer, provided technical advice and support for developing the computer engineering program, and taught computer engineering courses.

See [www.uprm.edu/](http://www.uprm.edu/) and [www.ece.uprm.edu/inelicom/index.php](http://www.ece.uprm.edu/inelicom/index.php)

**1969 - 1972: Bell Telephone Laboratories, Naperville, IL. (now Lucent Technologies)**

***Member of Technical Staff, Electronic Switching Division***

Performed analysis of No. 1 ESS software engineering procedures, developed software tools to carry out and monitor No. 1 ESS software. Taught in-hours courses in PL/1 and IBM 360/370 assembly language.

See [www.bell-labs.com/](http://www.bell-labs.com/)

**1966 - 1969 and 1972 - 1978: University of Connecticut, Storrs, Conn.**

***Administrative Professional Staff, Technical Assistant to University Chief of Data Processing***

Advised the Chief of Data Processing in decisions on equipment, systems strategy, and operations policy.

Designed and operated database systems serving University Registrar and Office of Institutional Research, particularly student course registration and automatic student scheduling.

***Visiting Instructor, U.Conn. EECS Department***

Taught courses in introductory PL/1 programming and software engineering.

See [www.uconn.edu/](http://www.uconn.edu/) and [www.eng2.uconn.edu/](http://www.eng2.uconn.edu/)

**Specific Computer Experience:**

Operating Systems: Microsoft Windows Win10, Win 8,Win7, Vista, WinXP, Win2000, WinNT4, Win98, Win3.1, MSDOS, UNIX, IBM MVS/TSO, VM/CMS, CP/M, OS-9, pSos, VXworks, and other various mini / micro computer systems, Microsoft MSDN Universal Subscription, MS Visual Studio 2015, 2010, 7(.net), 6, 5, 4.2, 2.0, 1.52, 1.

Languages: C#, C/C++, VB, Java, Perl, Pascal, Fortran, COBOL, PL/1, LISP, Prolog, Assembly Languages, and others. Experience with Visual Studio, Win32 API, MFC GUI, and .NET development.

Experience with Microsoft IIS, Office, Access, Project, VISIO and other related office support systems.

Experience with Microsoft Windows SDK / DDK, Visual J++ / C++ / MFC / AFX /.NET, Win16 and Win32 API, Windows NT kernel mode programming, WinNT HAL development, WinNT device driver development.

Experience with Ethernet LAN, INTERNET WAN environments and HTML WEB and CGI development.

Experience with TCP/IP, X.25, IEEE 802.3 Ethernet, 802.5 Token Ring, and 802.2 LLC protocols

Experience configuring Windows 2000 Server as a domain controller, remote operations, VPN.

Experience with Sparx Enterprise Architect (EA), IBM DOORS, Serena RTM, Booch, OMT, UML / Rational Rose Object Oriented analysis / design tool, SADT graphical analysis language, Structured Analysis, CADRE/Teamwork CASE tool environment, and others.

Experience with OrCAD, Spice, CALMA VLSI design / layout tool, MicroCap, ECAP, and other CAD tools.

Experience with embedded system and microcomputer cross-development environments especially
Texas Instruments TMS320Cxx, Intel 8051, 80x86 series including Pentium, Zilog Z80 and Z8, Toshiba TLCS-870, Motorola 68K and HellCat (PPC 860).

**Professional Activities and Honors:**

1) WSU Host to Washington Software Association.

2) Co-Chair of the IEEE (Rochester) ASIC 1991 Analog/Digital Design Session.

3) Acting Chair of NorthCon 1991 session on Design Methodology.

4) Member of IEEE, ACM, Tau Beta Pi, Eta Kappa Nu, Phi Kappa Phi.

5) GTE Software Award (1984) ZEUS hardware description language translator using YACC/LEX

6) GTE Software Award (1984) SPARTA (System Partitioning Aid) testbed using ZEUS and PROLOG

7) IEEE Outstanding Paper Award (1978 COMPSAC)

8) GTE NSF/IURP Principal Investigator (1982, 1987, 1988)

9) GTE EADP (Engineering Associate Development Program) Supervisor (1986)

**Volunteer and Civic Service:**

1) Amateur Radio - W1TR, extra class, licensed and active since 1961

2) Active ARRL Voluneer Examiner for amateur radio licensing.

3) Active Volunteer Educator for amateur radio license classes.

4) Member of USAF MARS (Military Affiliate Radio System) since 1976, State Director Mass. 1984-1988

5) USAF MARS HF Radio Packet Network operator during Desert Storm, Packet Network Operations Analysis Manager, Alternate Region ONE Net Control Station.

**Courses Taught:**

SE 5301 Embedded / Networked Systems Modeling Abstractions

CSE 3000 Contemporary Issues in Computer Science and Engineering

CSE 2500 Introduction to Discrete Systems

CS-451 Introduction to Database Systems (WSU)

CS-551 Database Systems (WSU)

CS-483 Object Oriented Microsoft Windows Application Development (WSU)

CS-443 Microsoft Windows Application Development (WSU)

CS-423 Software Engineering Laboratory (WSU)

CS-422 Software Engineering Principles (WSU)

EE-424 Computer Architecture (WSU)

EE-314 Microcomputer Systems (WSU)

EE 16.663 Compiler Structures (UMass / Lowell)

EE 16.574 Digital Subsystems (UMass / Lowell)

EE 16.524 Programming Languages (UMass / Lowell)

Logic Design (Univ. Puerto Rico / Mayaguez)

Microcomputers (Univ. Puerto Rico / Mayaguez)

CS 265 Software Engineering Laboratory (UConn / Storrs)

CS 101 Introduction to Computer Science (UConn / Storrs)

PL/1 Programming (Bell Labs, Naperville)

360 Assembly Language Programming (Bell Labs, Naperville, IL)

**Publications:**

**Books and Chapters:**

1) Beth Britt, T. G. Glagowski, ‘Reconstructive Derivational Analogy: An Approach to Automating Redesign’, Proceedings of International Joint Conference on Artificial Intelligence Workshop on Machine Learning and Engineering, B. Julien and S. Feneves (ed), Morgan Kaufman, San Mateo, CA 1995 (to appear Aug 1995).

2) T. Glagowski, B. Britt, ‘Explanation of Designs through Heuristic Reasoning,’ INTELLIGENT SYSTEMS:, Vol 1, pp 39-44, Kluwer Academic Publishers, London, 1995

3) ‘Human Factors in Robot Teach Programming,’ by T.G. Glagowski, H. Pedram, Y. Shamash, in the handbook ‘Human-Robot Interaction,’ edited by Mansour Rahimi, Taylor and Francis, London, 1992.

**Journals:**

1) T. G. Glagowski, Beth Britt, ‘Reconstructive Derivational Analogy: A Machine Learning Approach to Automating Redesign.’ in Artificial Intelligence for Engineering Design Analysis & Manufacturing, special issue on Machine Learning and Design, C. L. Dym (ed), Academic Press, London, 1997 (expected).

2) T. G. Glagowski, Kent Jones, ‘A New Method for Implementing Fuzzy Retrieval from a Spatial Database,’ accepted for publication in Information Sciences: an International Journal.

**Conference Publications (refereed):**

1) T. Glagowski, W.E. Deforeest, ‘Indexing to Efficiently Support Fuzzy Queries on Range Specifications’, Proceedings of the Second International Conference on Engineering of Complex Computer Systems, October 21-25, 1996, Montreal, Canada, pp 366-375.

2) T. Glagowski, M.L. Manwaring, K.L. Jones, ‘An Engineering Design Process Supported by Knowledge Retrieval from a Spatial Database’, Proceedings of the Second International Conference on Engineering of Complex Computer Systems, October 21-25, 1996, Montreal, Canada, pp 395-398.

3) T. Glagowski, B. Britt, ‘Explanation of Designs through Heuristic Reasoning,’ Golden West International Conference on Artificial Intelligence, July 6-8, 1994, Las Vegas, Nevada.

4) T. Glagowski, B. Britt, ‘Using Learning Techniques to Automate Design,’ Workshop Notes on Machine Learning and Design, Artificial Intelligence & Design Conference, 15-18 Aug, 1994, Lausanne, Switzerland.

5) T. Glagowski, B. Britt, ‘Using Design Rationales to Guide Design Planning,’ Workshop Notes on Design Rationales, Artificial Intelligence & Design Conference, 15-18 Aug, 1994, Lausanne, Switzerland.

6) T. G. Glagowski, L. Y. Sy, S. V. Somanchi, and M. L. Manwaring, ‘A Framework for the Automated Design of Analog Subsystems,’ 33rd Midwest Symposium on Circuits and Systems, Calgary, Alberta, Canada, Aug. 1990.

7) T. G. Glagowski, and M. L. Manwaring, ‘A Design Methodology for Module Generators that Includes Operational Sensitivities,’ IEEE 3rd Annual Workshop on Reliability and Maintainability in Computer Aided Engineering, Leesburg, VA, Sept. 1989.

8) T. G. Glagowski, ‘Using a Relational Query Language as a Software Maintenance Tool,’ Conference on Software Maintenance, Washington, DC, November, 1985.

9) T. G. Glagowski, M. L. Manwaring, J. L. Meador, R. Shridar, ‘On Obtaining Objective Comparisons between High and Low Level Language Machines,’ Asilomar Conference on Circuits, Systems, and Computers, Monterey, California, November, 1984.

10) T. G. Glagowski, ‘A Model of Software Designs and Implementations and Its Application in Software Maintenance,’ Ph.D. Dissertation, University of Connecticut, 1984.

11) T. G. Glagowski and J. R. White, ‘A Relational View of a Software Design Model,’ IEEE COMPSAC, 1978 (invited publication, paper received 1978 IEEE Computer Society Outstanding Paper Award).

 **Industrial & Commercial System Development:**

**Jacobs Technology** – **DAFIF Data Analysis Tool** (2010-2012) design and development of an MS Access / VBA based analysis tool for the National Geo-Spatial Agency (NGA) Digital Aeronautical Flight Information File (DAFIF) Database. The tool is capable of checking the consistency of specifications and data, and producing an XML / XSD schema for export and use in other modeling tools such as Enterprise Architect, and visualization of flight procedures using Google Earth via KML file exports. *(member of multi-person multi-organization team)*

**Engility Corporation (L-3 / Titan) & Jacobs Technology** – **Requirements Management and Traceability Tool** (2007-2009) design and development of an MS Access / VBA based Requirements Management Database and Computer Aided Requirements Management System (MiniDoors). This was designed to be a simplified system for management of requirements until RFP release and contract award, at which time the requirements are downloaded to the contractor. *(member of multi-person multi-organization team)*

**Mission Planing Central (MPC)** (2004) organized, planned, and lead the creation of an information sharing database / WEB site using Sharepoint based at Hill AFB, UT, accessible from any and all DoD and contractor sites on the Global Information Grid (GIG). This involved capturing of organization requirements, information needs, work flow processing, PC authentication and access controls. *(member of multi-person multi-organization team)*

**Titan Corporation – FogEye Safety Sentry Test Platform** (2003) - architecture, development, and deployment of a data acquisition and surveillance system to test a 3rd party device for use in taxiway vehicle intrusion detection for the US DOT / FAA (Volpe Center). The system made use of a laser radar sensor, video camera frame grabber, and data feed from the vendor’s system under test. *(member of multi-person multi-organization team)*

**Titan Corporation – Wake Vortex Data Acquisition and Analysis Systems** (2003-2004) - architecture, development, and deployment of a multi-site remote computer complex for acquisition and analysis of data from sensors to support research on wake vortex turbulence (from aircraft wingtips) by the US DOT / FAA (Volpe Center) at domestic commercial airports. *(member of multi-person multi-organization team)*

**Integrated Dynamics Engineering. – Robot Control System Software / Firmware** (2000-2002) - development of WinNT host application software and robot embedded firmware (TMS320xx) to control materials handling robotic systems for semiconductor manufacturing *(leader of 6 person team)*

**Invenio Technologies Corp. – NAPIER Open Sensor Infrastructure** (2000) - development of the next generation system of remotely deployed agents and sensors to monitor and control large scale IT systems and business to business E-Commerce information systems. *(member of 3 person team)*

**Quadrant Software – Fast Fax / LAN – Fax Manager System Component** (1999) - development of a large scale multi-threaded FAX send / receive server based on Windows / NT. This server is accessible from an IBM AS/400 and its application suite for businesses (JD Edwards), other Windows NT File Servers, and Win 9x / NT client applications, via ODBC and SyBase SQL Anywhere. The system makes use of simple Class 1 single line FAX modem cards, Class 2 multi-line FAX modem cards, advanced GAMMA DID and BrookTrout DSP modems, and T1 digital trunk interfaces *(member of 3 person team)*

**VenturCom – Windows NT 4.0 SMP Custom HAL** (1998) - development of a custom HAL (Hardware Abstraction Layer) module for the multiple processor (SMP) VenturCom RTX (real time operating system extension) for Windows NT. *(member of 3 person team)*

**LGERCA - HomeNet LAN - Digital Video Recorder** (1997-1999) - development of a home based video server (Digital Video Recorder) that can simultaneously record and playback several digital audio / video streams (including digitized analog broadcast streams) under the control of clients on the IEEE 1394 based HomeNet LAN. Target platforms include Windows NT and an embedded reference hardware using Motorola PPC 860 and David / OS-9. Details are company private. *(member of 3 person team)*

**LGERCA - ATSC PSIP Test Generator** (1998) - development of an ATSC transport stream PSIP table data generator based on the ATSC A65 standard. This tool allows digital television designers to test their equipment during development. *(single person in coordination with several international product divisions)*

**LGERCA (1997) - development environment and toolset** (1997-) - for requirements / design modeling and implementation in Java / C++ for Microsoft Windows and embedded target platforms. Primary modeling tools included Visio for general modeling, and Rational Rose for modeling in UML with code generation / reverse engineering to maintain synchronism between design and implementation documents. Coding environment includes Sun JDK, Visual J++, Visual C++, Visual SourceSafe, GNU UNIX tools, and others associated with embedded target platforms. The environment is hosted on Windows NT / Server and coupled to the intranet. *(primary responsibility and coordinator)*

**LGERCA - InfoSpace private intranet WEB site** (1997) - (http://info.lgerca.com/) established to disseminate corporate policy and administrative information, classify and index research information for later retrieval via WEB forms, facilitate local project newsgroups, and provide local site computer system help. System was authored with Microsoft FrontPage 98 / Perl 5, and hosted on Windows NT/Server using the IIS / BackOffice server. *(lead member of 3 person team)*

**LGERCA - LG Electronics Research Center of America public internet WEB site** (1997) -(http://www.lgerca.com/) established to publicly advertise the center to the technological community and to attract new employees. *(technical member of 4 person team) (note: LGERCA is now Triveni Digital)* www.TraveniDigital.com

**Bose Corporation: LifeStyle 50 Home Entertainment System** (1996-1997) - details of the product are company private but involved the development of a multiple processor distributed system with wireless LAN and LCD touchscreen interface that will become a new member of the Bose LifeStyle product family. Tasks included development of a small real-time operating system, user interface for LCD and touchscreen, device drivers for I2C, RS-232, PLL, RF-link and other electronic devices common in consumer electronics equipment. *(senior member of 3 person team)*

**GTE Govt. Systems: AFC2S CASE Tool Testing** (1989) - this activity was an internal test of the CASE tool environment developed by GTE to support the Air Force Command and Control System Modernization contract. The tool used the Oracle database system as the repository and a number of internally and externally developed Information Engineering and systems analysis tools such as Excelerator / PC Prism *(leader of 3 person team)*

**GTE Govt. Systems: Modernization Methodology for Air Force Command and Control System (AFC2S)** (1989) - this document was the operational guide and instructional manual for carrying out the system analysis tasks of the GTE contract with Air Force to modernize their Command and Control Systems. *(member of 6 person team)*

**GTE Govt. Systems: Air Force Command and Control System (AFC2S)** (1989) - this large government contract had the scope of complete modernization of approximately 30 million lines of legacy code using new technology and methods such as Information Engineering and DoD 2167A software development standards. *(member of large corporate team)*

**GTE Generic Business Modeling System (GBMS)** (1987) - this system was an experimental CASE tool that used an expert system questionnaire approach to modeling a business for the purpose of identifying data requirements for a corporate database and application processing requirements. This tool worked cooperatively with KnowledgeWare Information Engineering Workbench. Ultimately these requirements would be used to drive application generators to interface a database managements system. *(leader of a 3 person team)*

**GTE: Silicon Compiler Hardware Partitioning System** (SPARTA) (1984) - this experimental system was developed to investigate the automatic partitioning of electronic systems described in the MODULA-like ZEUS Hardware Description Language (alternative to VHDL) into major hierarchical partitions down to the chip level, which would then be automatically designed by a silicon compiler. *(member of a 2 person team)*

**GTE: Direct Execution Microprocessor** (1983) - this experimental development project investigated the feasibility of using directly executed high level language (e.g. LISP and the 1979 MIT Scheme chip) for use in electronic programmable controller products such as the GTE Sylvania Modular Electronic Control Assembly (MECA). The goal was to solve the dilemma of slower than real time interpreted execution that provided program change flexibility, versus the time delay of compilation to achieve full real-time execution speed. The cost and size of main and external memory for the development host were also a consideration. A direct execution microcomputer prototype was fabricated using 2 custom VLSI chip types made from 5 micron NMOS using internal GTE labs CAD tools and in-house foundry. Major components included:

VLSI Push Down Automata Controller Chip - capable of executing LL1 grammars 100 recursions
VLSI Content Addressable Symbol Table Chip - capable of storing 8 symbols 4 bytes, cascadable
CPU Board - contained controller and microcode, wire wrapped S-100 board
CAM Board - contained HW Symbol Table Chips cascaded, wire wrapped S-100 board
Data Path Board - contained AMI 29000 series bit-sliced data path chips, wire wrapped S-100 board
Microcode Cross Development Tools - Cross compiler to create DEM microcode
Microcode O/S and AL2 Language - DEM system software
*(leader of 7 person team at both GTE and Washington State University)*

**GTE: MECA Portable Development Host** (1981) - this system was a portable S-100 Z80 based system with a physical package similar to the original Osborn 1 computer, but with system software based on NorthStar DOS and later CP/M 80, which would both interpret and compile a simplified version of BASIC known as SYBIL (Sylvania Basic Industrial Language). This apparatus was used to emulate control algorithms by signaling the MECA system via an RS-232 data link, or program the algorithm into EPROMS after the control algorithm was perfected. *(member of 3 person)*

**GTE: Modular Electronic Control Assembly (MECA) User Manual** (1981) - this document was the complete user's manual for the 8051 based electronic programmable control system and associated development host that was eventually produced and marketed by GTE Sylvania. *(sole author with review by domain experts)*

**GTE: Automatic Test Executor ATE** (1980) - this system automatically carries out stimulus / response behavioral tests and compares the results to expected behavior noting exceptions. Hardware platform included an IBM 3090 mainframe for test scenario cross-development, and DEC PDP-11 mini-computer for execution of tests. *(member of 6 person team)*

**GTE: GTD-120 Requirements Model** (1979) - this report manually created the description of an already existing GTD-120 PABX product, but using an internally developed bi-partite graph requirements modeling method. The purpose was to determine the feasibility of using one of several proposed requirements languages (P2 and RTRL) for describing telephone switch behavioral requirements. *(member of 3 person team).*

**UConn Academic Resource Utilization** (1978) - this system calculates utilization of academic resources for reporting to University and state officials, including building/room utilization, instructor contract hours, teaching loads, and other metrics used to calculate budget projections. *(supervisor of two student developers).*

**Bell Labs: Compool Record** (1971) - this system saved computer resources expended on system builds of the No. 1 ESS Generic Program (over one million lines of code) by tracking the changed definition of global symbols and macros and their use by modules, thereby requiring compilation of only those modules referencing changed symbols. *(sole developer working with several domain experts)*

**UConn Student Scheduling** (1967,1972,1975) - this system schedules students to classes granting section choices and alternate courses. The earliest version (1967) was built as an emergency replacement for the IBM CLASS/7040 scheduling program when IBM abandoned IBSYS (7040/7090) in favor of the System/360 in the mid-sixties. Later versions (1972) allowed administrators to prioritize enrollment in courses by major or class standing, and included extensive peripheral reports and file management sub-systems for the course catalog, semester schedule of classes, student request / enrollment files, etc. The final system (1975) included sophisticated metrics to monitor the operation of the heuristic algorithms and allow for fine tuning of the scheduling process. This system was in use until 1996 when a modern commercially available online telephone registration system was acquired. *(sole developer working with many domain experts over many years)*

**Consulting:**

**Panametrics (Waltham, MA) thru the Entegee Agency (Waltham, MA)** (April 2000) – this was a short term contract to develop a Windows-like GUI for an embedded system (Motorola 68323 series) hosted in a hand held instrument for measuring gas flow and pressure. Rational Rose UML modeling and round trip engineering were used to create a C++ application for this system.

**WSU Small Business Development Center (SBDC)** (1990-95) - this ongoing contract with SBDC provides my services as a patent / product reviewer to inventors wishing to submit their idea for review prior to patent application or venture capital procurement.

**Kreager Associates, Inc (KAI)** (1994-95) - this ongoing University contract with KAI is for the development of a proprietary computer network (ETHERNET) CAD tool using C/C++ to function under the Microsoft Windows operating environment.

**PWS/Kent Publishing Co.** (1993-94) - this work involved the review of two books, one on the topic of the DEMETER object oriented development environment, and the other on Power PC Assembly Language Programming.

**Bedini Electronics / Tom Walsh, Patent Atty** (1993) - this work involved assisting the client in obtaining a patent (#5,487,057 - US Patent Office: Apparatus and Method for Reducing Electronic Relaxation Noise Present in Information Recording Medium issued January 23, 1996) for a device that improves the sound of CD audio recordings, by electronically measuring the result of applying his device, and preparing reports for the patent application process.

**Modeling Technologies Inc /ZDI** (1991) - this work involved the assistance of a party involved with a GTE contract associated with the GBMS (1987) for which I was group leader. The party was entitled to a copy of the software developed according to a technology sharing agreement with GTE and needed some additional assistance in installing / operating the software after the contract with GTE ended. The client was referred to me by the GTE corporate attorney.

**Hewlett Packard, Spokane Division** (1990) Enhancement of the HP 11836A 0.3 GMSK Modulation Measurement Software Package - this university contract involved software maintenance to an electronic instrument that performed modulation analysis. Modulation rate, packet bit size, and digital filter configurations had to be changed, and the system tested against laboratory hardware.

**National CSS** (1969) - this work involved installation of the Electronic Circuit Analysis Package (ECAP) on the VP/CSS time sharing system (a 3rd party version of VM/370 CMS). The original program as delivered required overlays, which did not function well under virtual memory, and had to be reorganized.