

## Education

### Master of Science, Information and Computer Science

Georgia Institute of Technology, 1983  
Emphasis in operating systems, computer graphics and digital control systems.

### Bachelor of Electrical Engineering Technology

Southern Polytechnic State University, 1981  
Emphasis in digital design and control systems.

## Qualification Summary

I have experience as a developer, mentor, technical lead and manager, and I am flexible and comfortable in many roles. While I work well in teams I also enjoy independent, self-directed projects. I have a track record of innovation staying current with research applicable to a variety of problems. I have a broad academic background covering hardware and software systems, and I stay current in those areas by maintaining contact with the academic community.

## Areas of Interest

- High performance distributed systems.
- Embedded and real-time systems.
- Software development methodologies and practice.

## Experience

### Senior Staff Software Engineer (09/2006-present)

*Scientific Atlanta*

*This position involved software and systems design, and technical leadership in a team environment. Technical coordination with vendors, customers and internal departments is required.*

I am technical lead on Personal Video Recorder aspects of IP TV set top box (STB). This work involves coordination with contract software firm to integrate third party software into existing STB code, verify proper operation and customize and enhance the feature set.

### Computer Scientist (06/1996-present)

*MileStone Solutions Inc.*

*This position involves research, analysis, design, development, documentation and training. As a small business, responsibility for business infrastructure and operations is also required. This requires flexibility and the ability to coordinate conflicting demands under aggressive schedules. Communication skills, especially with non-technical audiences, is key.*

I reverse-engineered a legacy Java program for a cellular antenna application. This program communicates to cell tower equipment over a serial interface and had been widely deployed on Windows systems prompting the company to upgrade from legacy Java Comm API to the open source RXTX implementation. This work involved decompilation of legacy code, development environment setup, re-integration with Serial I/O APIs, installer packaging and testing.

I provided a minimal Linux installation supporting a remote desktop client. This installation was deployed on 128MB Compact Flash and allowed re-purposing of thin client hardware.

I was the sole designer, developer and supplier of *nowMessenger!*, a desktop client providing internet connectivity to a wide range of wireless devices using SNPP and SMTP protocols. This is a Java Web Start application supporting automatic upgrades, online help and PayPal donations. I implemented an e-commerce system integrating application registration with an online payment system built around PayPal.

I have ongoing responsibility for installation and maintenance of MileStone Solutions' network facility including Web site maintenance, development infrastructure, network security, and centralized backup. I

## Kenneth M. Thompson

maintain email servers with virtual hosts, mail lists, spam prevention and virus scanning. I operate the corporate telecom infrastructure and wireless messaging services. I maintain a heterogeneous network of Linux, Sparc Solaris (2.6), and Microsoft systems.

I was a key member of a small, elite team chartered to implement a mission-critical Billing System middleware for Cingular Wireless. This was Cingular's first J2EE deployment, consolidating billing system access with an XML-based client interface to legacy systems. This work was completed under aggressive time constraints including FCC mandated number portability rollouts. I researched and co-developed an adaptive load shedding mechanism to isolate front-end clients from partial back-end failures. I installed, maintained and championed source code management, production build infrastructure, and client problem and service quality reporting systems.

I designed, implemented and deployed IVR middleware for Cingular Wireless. This multi-component design included a socket server front end interfacing to Periphonics IVR systems and a J2EE middle-ware protocol converter. The design extracted the business logic from the EJB framework allowing alternative deployments without a container. This system replaced multiple field-deployed Windows NT and Solaris based systems consolidating administration and system maintenance. My design provided high availability and performance and was tolerant of back-end failure. Once complete, I transitioned the project to Cingular's existing IVR development team.

I designed, implemented and deployed a National SIM Manager for Cingular Wireless. This was based on MileStone's TCP/IP server toolkit, and provided system wide access to the SIM management and allocation system using an Oracle database.

I designed and implemented a multi-threaded, multi-port TCP/IP server framework. This software is used in various projects in multiple application domains. This framework handles all issues of multi-threading, and provides client services and server control ports.

I designed and implemented a Unified Communications system using Java, JDBC, servlets and JSP, Linux, postgresSQL, and hylaFAX. System features include Web administration and communications services, FAX and voice mail forwarding and forwarding to email. This system interfaces to a proprietary switch providing an IVR front-end.

I designed and implemented a GUI layout and specification system that uses an enhanced HTML table-like layout that is interpreted by a custom layout manager. The implementation uses a factory design pattern for constructing GUI components and connecting components to application methods.

I researched and designed a central subscriber information database for online access by distributed telephony systems. This system provides low-latency access to subscriber network information required for routing messages. My research included performance analysis of the existing legacy system and the proposed new design. The implementation used postgresSQL and java/JDBC to provide TCP and UDP network access to client applications. This project included all aspects of system design and deployment, including platform and technology selection, software architecture, database design and development of all support tools and scripts for operation. My design resulted in two orders of magnitude performance improvement over an Oracle system running on the same hardware.

I designed and developed an outdial telephone conferencing system as a core component of a Unified Messaging system. This system uses Dialogic T1 and Conferencing components on an SCO UNIX platform and was implemented in C.

I designed and developed an email-to-wireless-messaging gateway. This system is architected for low transport latency, high availability and zero message loss under partial failure. The design included custom sendmail rulesets, a spooling Mail Delivery Agent, and a Java network daemon processing spooled messages and integrating back-end messaging services.

I designed and developed an SNPP gateway as a Java network daemon. Enhancements include splitting large messages into multiple pages and detailed logging of client access.

I designed and developed Head End Controller software for an addressable TAP marketed by RF Communications Group, a division of Itochu. This project was developed in Java and involved multiple cable

## Kenneth M. Thompson

billing system interfaces, a Graphical User Interface using JFC/Swing, and serial interface to a Maspro Data Transmitter. I coordinated the design of the Maspro Protocol with the team in Japan.

I developed and maintained Web applications for Satellink Communications, Inc. These applications automated pre-existing paper forms increasing the efficiencies of Satellink Customer Care and Billing Operations. I worked on the design and implementation of Internet and Web services (Unified Messaging) integrated with existing paging operations. I installed and maintained intranet Web facilities including Web servers, relational databases, network based FAX and modem servers, and Web-based alpha paging services. I installed UNIX systems and administered various operating systems, primarily Linux and SCO.

I developed and maintained Perl CGI scripts for Melia Design Group, Inc. Projects included development and debug of registration, trivia contest scripts for Turner Affiliate Resources, and site access control.

I was a key software developer of OnCart's (previously Shoppers Express's) Commercial Web Application for internet-based retail grocery delivery. I was responsible for the middle tier between the Netscape Commerce server and a Sybase data repository. The middle-ware relied on ONC/RPC with a trial port to DCE RPC running on HP/UX. I implemented a software system in C++ that generated HTML pages incorporating data retrieved from a Sybase database. I was also responsible for maintenance and upgrade of HP-UX (OS upgrades, patches and Netscape upgrades) and coordinated with Netscape to resolve technical issues in using Netscape API. I installed and maintained g++ and other FSF tools and modified g++ libraries to support shared library loading from the Netscape application. I re-implemented the GNU REGEX regular expression library using POSIX REGEX libraries eliminating memory leaks. I designed JavaScript line item ordering and Credit Card validation for the customer facing shopping application.

I provided system configuration and administration for Alumax's HP-UX systems that hosted data consolidation and reporting applications for regional and international operations. My responsibilities included: installation and software migration to new K-class 10.x system from C-class 9.x system; system configuration and upgrade, including logical volume configuration and management; installation of software and patches; and UNIX user support.

I provided initial setup and configuration of Sun Solaris systems for the Materials Research lab in the Mechanical Engineering department at Georgia Tech.

### **Software Engineer (07/2004-09/2006)**

EGT

*This position involved software and systems design, business development, technical leadership, and mentoring new hires and co-op students. This required advanced technical skills and the ability to work effectively in multiple roles, coordinating efforts with all other groups in the organization as well as technical liaison to vendors and customers.*

I brought a new product from concept to customer field trials and initial sales. This product, HEMi, integrates MPEG2 encoding, SPTS/MPTS stream multiplexing, QAM Modulation and RF upconversion and opened a new market area for the company. This project required customer coordination for requirements, vendor qualification and coordination, application integration and new development in C and C++ on a custom Linux platform.

I co-designed and developed a closed-loop multiplexing solution for EGT's MPEG encoders. This distributed implementation required an adaptive time synchronization mechanism and integration with the MPEG encoding algorithm software. I made additional enhancements for Digital Program Insertion.

I championed the use of collaboration development tools to facilitate communication and provide a knowledge repository, and a lightweight mechanism for project tracking. I provided internal support to manufacturing and quality assurance teams including delivery of production software, technical support for manual production, and in-house Web based tools for production configuration and testing.

During a company reorganization I filled the roll of Technical Manager of Platform Software and provided technical direction for a diverse team responsible for architecture, Verilog/FPGA design and implementation, RTOS support, device drivers, and development infrastructure. I was involved in evaluating candidates for positions throughout the company, including Product Development, Testing, and Marketing.

## Kenneth M. Thompson

### **Senior Software Engineer** (06/1994-06/1996)

*ANTEC/Digital Video*

*This position involved research, directed development, and work with international standards organizations. This stressed independent work, multi-tasking and communication skills.*

I researched and developed technology for Digital Video's Video Server products, performing system analysis and testing, and evaluation of configurations, components and architectures. I established performance benchmarks in support of vendor qualification and selection.

I researched and designed the MPEG Constant Bit Rate Server (Video Pump) components of the Digital Video Server Network. I coordinated the compilation of the Ad Insertion Product Specification as well as authoring the Video Pump specifications. I designed and implemented (in C++) the Video Pump, including UNIX real-time support for Constant Bit Rate output and custom UNIX device drivers.

I was the sole company representative in U.S. and International Standards work including Company Representative to ANSI X3L3.1 committee on Audio/Picture Coding and National Delegate from the United States to the International Standards Organization (ISO) for MPEG (SC29/WG11).

I authored "Distributed Video Server Architecture," a paper and presentation given by the Digital Video VP of Engineering to the SCTE. I supported Marketing with RFPs, and performed routine system administration including system backups and NIS installation.

My work supporting Digital Video's patent activity included disclosures and associated technical documentation, and resulted in three patents.

### **Senior Software Engineer** (11/1991-05/1994)

*Melita International(eShare)*

*This position involved rapid application development on new systems and maintenance of legacy systems. This required broad knowledge of technology, and excellent development and communication skills.*

I had a lead technical role in design, development and documentation of Melita's next generation predictive dialing product, transitioning the product line from Windows to UNIX. I authored Requirements and Design documents, and reviewed emerging technologies including ISDN, Central Office based services(AIN). I participated in technology strategy meetings with Marketing, Operations and Company Executives.

I implemented a high reliability Client/Server architecture based on ONC/RPC, and designed an event and message logging subsystem. I co-authored a software development guides and established procedures for Requirements and Design documentation and created a source documentation system with function call-graphs. I performed routine system administration and ported FSF compilers, version control and editors to multiple UNIX platforms including RS/6000 AIX and SCO 386;

### **Manager, Software Engineering** (05/1989-06/1991)

*IVEX Corporation*

*This position involved managing software developers and leading the design and support of legacy and new systems. This stressed system design and software team leadership skills.*

As manager I was responsible for hiring and training Software Engineers and Co-op students working in the group. I established Software Engineering guidelines for a diverse software environment and supervised all software development efforts. I installed a Source Code Control System and instituted Software Problem Resolution procedures. I upgraded the development tool chain with workstation hosted cross-development tools. I consolidated per-customer software versions to reduce maintenance costs. I provided national and international customer site support. I authored technical specifications, designed the control architecture, and wrote a custom IEEE 802.3 (ethernet) interface driver for new products. I took a lead role as system and software designer of second generation product, made major feature enhancements and coordinated initial system delivery to the pilot customer.

### **Instructor (part-time)** (09/1985-06/1989)

*Southern Polytechnic State University (Southern Tech)*

*This position involved course preparation, classroom teaching and administration, and mentoring in labs. This required extensive knowledge across a wide variety of technical areas and ability to present new technical material to students.*

I planned and taught courses in Computer Organization, Computer Graphics, and Programming Languages in the School of Applied Computer Science. I developed Graphics and C Programming courses and I developed a

## Kenneth M. Thompson

microprogramming simulator as an aid in teaching Computer Organization. I also co-developed a C Programming Seminar for the Continuing Education Department.

### **Member of Scientific Staff** (08/1987-05/1989)

*Bell Northern Research (Nortel)*

*This position involved hard real time application development in a formal development environment. This required strong development and communication skills, and ability to work effectively under pressure.*

I co-authored a telecommunications site survey of a multi-tenant office complex as a basis for investigating new product opportunities. I performed architectural design of a T1 multiplexor product. I ported and enhanced a proprietary 8086 based real time operating system to improve performance, allow the use of expanded memory, support additional PL/M memory models, and support upgraded hardware.

### **Senior Engineer** (05/1986-05/1987)

*BBL Industries*

*This position required project management, coordination with all operational groups involved in production delivery and software development in a hard real time environment. This required excellent software architecture and analysis and stressed communication skills.*

I successfully managed a strategic software development project involving fifteen software engineers. My responsibilities included project planning and tracking, resource allocation, system organization, and development of key components. I coordinated all development activities with Operations and Marketing for product release. I was directly engaged in porting the RTOS file system, and I designed and implemented a real-time, in-memory subscriber database with a reliable persistence mechanism.

### **Software Engineer II** (05/1984-05/1986)

*Intecolor Corporation*

*This position involved low level software development and coordination with hardware developers to produce the highest possible performance. Real time software development and algorithm analysis were key requirements.*

I developed software for color VT-220 emulation in C and Z80 assembly focusing on the C to assembly interface and performance optimizations. I developed firmware for a custom, hardware-assisted screen fill for Intecolor's high performance process control graphics terminals. I performed an architectural analysis and developed requirements for next generation graphics terminal real-time operating systems.

### **Software Engineer** (05/1983-05/1984)

*Chalk Board, Inc.*

*This position involved software development on custom hardware, coordination with manufacturing facilities and collaboration with domain experts. This stressed technical and communication skills.*

I co-designed and developed two interactive graphics products ported to multiple platforms. These included a simple free-form paint program intended for young pre-schoolers, and a more complex drawing program for older students. These were ported to the IBM PC and to Motorola 6502 based machines including the Apple II, Commodore 64, and Atari, and required the development of low-level graphics libraries for each machine. I represented the company at trade shows and was technical liaison to manufacturing subcontractors where I established assembly procedures, monitored quality, and provided testing support.

### **Graduate Research Assistant** (09/1979-05/1983)

*Georgia Tech Engineering Experiment Station*

*This position required attention to detail, flexibility and ability to meet aggressive deadlines.*

I worked as an undergraduate, and later as a Graduate Research Assistant, with the Engineering Experiment Station Lab focused on appropriate technologies. I worked on projects in the areas of co-generation, passive and active solar systems, technologies for agricultural applications, and technologies in support of developing countries. Under a research grant from the Solar Applications Branch of the Tennessee Valley Authority I published a design for a low-cost passive solar agricultural building in January, 1983.

## Professional Affiliations

**Association for Computing Machinery (ACM)**, member since 1986.

**Institute of Electrical and Electronics Engineers (IEEE)**, member since 1987.

**Registered Engineer in Training**, State of Georgia, 1982.

# Kenneth M. Thompson

## Patents

### Service Manager For Adaptive Load Shedding

I was the lead researcher and designer, and led the initial development of an innovation improving J2EE/EJB application robustness. This design drew from current research in overload management and event driven architectures extending the concepts to reliability and availability as well as performance. Application filed in 2005.

### Data Multiplexing in MPEG Server to Decoder Systems

I researched and designed non-video/non-audio data transmission across a dedicated server to an MPEG decoder link. This work became the basis for On Screen Display applications including channel guides and advertising. Patent number 5856973 awarded in 1999.

### Method and apparatus for transmitting MPEG data at an adaptive data rate

I researched, designed and implemented an innovative mechanism addressing variable video bitrates and variations in server real-time performance. This reduced decoder buffer sizes, significantly reducing system cost. Patent number 5881245 awarded in 1999.

### Flexible, Configurable, Hierarchical System for Distributing Programming

I provided the system level design and core software architecture that became the basis for the company's core technology. This work addresses the timely delivery of large-file video content throughout a widely distributed hierarchical store and forward server system. Patent number 5892535 awarded in 1999.

## Publications

### Special Edition Using CGI

I authored material on simple server-side programming with C and Perl with extensive examples. Que/MCP, ISBN 0-7897-0740-3, Copyright 1996.

*Chapter Author*

### Special Edition Software Engineering with Turbo C++

I authored material on basic C++ programming concepts emphasizing code examples. Que/MCP, ISBN 1-56529-837-3, Copyright 1995.

*Chapter Author*

### Special Edition Using the Internet, First Edition

I authored the chapters on IRC (Internet Relay Chat). Que/MCP, ISBN 1-56529-353-3, Copyright 1994.

*Chapter Author*

### Solar Assisted Poultry Growout House Design

by Kenneth M. Thompson, Wiley D. Holcombe and Michael S. Smith,

I was design lead and principal author of the report on a zero incremental cost passive solar poultry growout house.

*Co-Author*

Georgia Tech Engineering Experiment Station, January, 1983.