

Thomas Neuendorffer

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Main Focus

The user interface is the art and aesthetic that completes a well engineered technical solution.
It is the window of opportunity for applying human knowledge and expertise to a problem.

Qualifications

Over twenty years of broad-based experience in developing a wide variety of network aware user interfaces. Proven ability to produce innovative solutions to complex problems in both business and research settings. Fields of interest include: tablet PCs, the web, application builders, information systems, rapid prototyping, collaborative work systems, graphics, animation, music, educational software, gaming systems, and advanced toolkit technology. Special skills and expertise:

- Developing timely and efficient multi-media applications for multiple platforms.
- Designing and implementing practical solutions to broadly defined problems.
- Creating software tools that support fast prototyping, application development, and improved workflow.
- Producing highly functional prototypes
- Directing teams to meet their potential.
- Developing both sides of client/server applications.
- Working either independently, or as a member of a team.
- Creating and conducting technical education classes.
- Writing and presenting technical papers.
- Coding in C, C++, Delphi, Flash Java, JDBC, and SQL.
- Experience with Oracle, Postgres, WAP/WML, VXML, XML, and HTML.
- Understanding and appreciation of both technical and business aspects of technological development.

Executive Summary

Tom Neuendorffer has been a pioneer in the field of human computer interaction for over two decades. After his work on Library systems and Client-server computing models at the University of Pittsburgh in the early eighties, he came to work with the Information Technology Center at Carnegie Melon, where he helped develop the Andrew user interface system. Andrew's many firsts included multi-media e-mail and embedded document architecture. Here he developed the pioneering GUI interface builder systems GLO and ADEW. They were the topics of several published papers, and ADEW was distributed on the early X11 tapes. He also managed the Andrew UI group, chaired two conferences, taught ATK tutorials, and developed the first playable musical instrument ever to be sent via e-mail. His work includes the Tactus system to support real-time synchronization of multimedia.

Upon leaving CMU, he helped to found Galt Technologies, whose NETWorth site was one of the largest and most popular personal finance sites from the early days of the World Wide Web. Serving as Chief Scientist, he was also the primary application designer and implementer for most of the site's applications, including what Money magazine called "The best fund screening engine on the web". He saw Galt through its acquisition by Intuit in 1996.

As Director of Prototype Development for Clairitech/Clairvoyance Corporation, Tom was responsible for developing new ways to view and search information. Some of his work in this field has just recently received a U.S. Patent for a unique method and apparatus for information mining and filtering. His work on this interface continued at the Clairitech spin-off Querria, where the technology was used to create sophisticated information filters for a major automobile manufacture.

Currently Tom is working for Carnegie Speech, developing a system to teach English as a second language to young children. Toward this end he has developed a client in Flash capable of presenting stories and exercises to the students, based on a custom designed scripting language. Integration with the Sphinx system allows the client to respond to voice input. He also developed a series of interfaces to support creation of content for this system.

Other recent work includes a paper with Roger Dannenberg on Sound Synthesis from Real-Time Video and consulting with a CMU research group on analysis of network traffic. Tom plays a variety of musical instruments and does volunteer work for North Park's Latodami Nature center. Recently he helped with a barn owl project by processing telemetry data from released owls and making their location available via Google maps.

Professional Experience

Carnegie Speech Corporation Pittsburgh, Pa 9/04 – present
Principal Engineer

Responsible for design and development of a system to teach English as a second language to children Kindergarten thru third grade. Requirements include development of systems to support the collaboration of authors, graphic artists and speakers who will create items that will; enable the children to learn by creating their own stories, which the computer will illustrate for them. The end system requirements include being able to run either stand-alone or networked on both Windows and Macintosh systems.

Carnegie Mellon University Pittsburgh, Pa 3/05 – present
User Interface Consultant

Consulting on interfaces and systems for monitoring network traffic

Queria LLC Pittsburgh, Pa 2/02 – 8/04
User Interface Consultant – Principal Engineer

Responsible for all user interface design and development at Queria. Expanded on work done at predecessor Claritech by creating Queria Filter Builder (QFB), a robust CAD-like interface for information discovery and filter generation. QFB has been used to create large knowledge resource trees that have categorized hundreds of thousands of input documents, turning unstructured text into a valuable knowledge resource for one of the world's top automobile manufactures. I have also worked on tools to generate QFB source documents from Web based sources.

Heinz School – Carnegie Mellon University Pittsburgh, Pa 3/02 – 6/02
Instructor (part-time)

Taught a level III Java course to graduate students in the Masters of Information Management program at CMU. This course covered various advanced topics in Java including database access and use in web application creation.

Evoxix Corporation Pittsburgh, Pa 6/01 – 1/02
Principal Engineer

Designed and implemented a 3 tier system to allow incoming text to be quickly summarized, categorized, and transformed to audio. Included in the system was an innovative system monitor for management to view system status. The system consists of a custom GUI front end connecting via http/https to a java/jdbc servlet. The backend connects to either an Oracle or Postgres database.

Also consulted and advised on the creation of an XML / VXML based system to deliver content to wireless phones.

Claritech / Clairvoyance Corporation Pittsburgh, Pa 10/97 – 4/01
Director of Prototype Development

Headed a small group charged with the design and implementation of functional advanced prototypes of Clarit based applications.

Clarit is an advanced text search engine with capabilities beyond that of standard databases. The challenge of this work was to discover and implement new applications that would take advantage of these capabilities. The target audience ranged from academics at conferences, to potential domestic clients, to the Claritech parent company, Justsystem of Japan.

The work produced includes Clarit Miner – A CAD-like interface to textual and database search, this work resulted in the recently granted US Patent . Other work included Clarit Mail – A prototype application for detecting spam and automatic classification; and Clarit Affinity – A prototype application to demonstrate the ability of a Clarit back-end to analyze the textual content of a web page and to pick a context appropriate banner ad to accompany that page.

Technical founder of Galt Technologies whose web site, NETWorth, grew from a 3 person operation, with one small server, to a site that handled millions of hits a day and was respected as the Premier mutual fund site on the Web. After less than 18 months online we arranged a merger with Intuit.

Initially responsible for the design and implementation of all technology related to the NETworth. Later concentrated more on advanced research and development. Accomplishments include the design and implementation of:

- "The best fund screening engine on the Net" (Money Magazine, Nov. 1996).
- An online registration system that supported over 1/2 million users.
- The initial web site of Charles Schwab Inc.
- The front end to the American Century online account access system.
- GAT, an NSAPI based system that interprets commands embedded within HTML text, and supports the aggregation of data from multiple back-end servers.
- A flexible web based portfolio system used by tens of thousands of people on a daily basis.
- A system that forwards client leads to fund companies.
- A quote server that queries an S & P Comstock box, and a web based front end that provides this information to Web users.
- A graphing system that downloads S & P information daily and allows web users to chart NAV and stock information.
- A system for loading and displaying Morningstar Fund information.
- A system for displaying Fund prospectuses.

Information Technology Center - Carnegie-Mellon University
Systems Designer

8/86 - 1/94

Pittsburgh , Pa

Manager, Andrew Toolkit Group

8/86 - 1/94

1/90 - 4/91

Primary designer and implementer of **ADEW** (the Andrew Development Environment Workbench), one of the first GUI design tools ever publicly distributed. The system allowed new applications to be prototyped and implemented with a minimum of programming. This system required the development of dozens of objects and has been presented at several conferences. Several demonstration applications were implemented including: The first electronic piano ever to be delivered in electronic mail; A user interface for controlling music synthesizers from an experimental sensor frame; A graphical interface to a scanner application; A prototype *help* program; and Prototype collaborative work software.

Worked on several other aspects of the **Andrew Toolkit (ATK)**, a system whose concepts inspired many successors, including MIME, OLE/COM, and JAVA. Its embedded object architecture supports dynamic loading, the separation of data-object and views, and document-based applications. The system includes a number of user interface objects (multifont text, raster images, spreadsheets, simple animation, hyperlinks, etc.) that can be combined into multimedia documents or used as the basis of other applications. ATK was used in several commercial applications, and was a direct precursor of the Java AWT. Responsibilities included the design, implementation, and documentation of ATK including work on system internals, as well as the development of intermediate objects, end user applications, and printing support. Created FAD, an embeddable animation object. Managed the ATK group for over a year and arranged and chaired the first ATK user group meeting held as part of the Xhibition '90 conference. ATK was distributed on all X tapes since late 1988 and was part of many Linux distributions.

Worked on **Tactus**, a system designed to provide toolkit level support for synchronization of continuous time objects (multimedia). This client/server architecture was implemented under AIX and Mach and was used to synchronize separate streams of software-based video, audio, midi, and graphics despite the presence of latency.

Center for Design of Educational Computing
Educational Software Specialist

Carnegie-Mellon University

1/85 - 7/86

Worked on programming with BE1, the predecessor to ATK, and WM, the indirect predecessor to X. Accomplishments include:

- GLO, one of the earliest examples of application building technology.
- FAD, a drawing editor that supports simple animation.
- ENZIT, C2ZIT, and BE2ZIT, software to translate Scribe, C, and BE1 files to support a structured editor.

University of Pittsburgh

Systems Analyst

2/81 - 12/84

Designed, implemented, and maintained a Unix-based library circulation system. The system was designed to keep user and circulation information locally, and to interact with a remote data base system for bibliographic data. The user interface supported the use of a bar code reader and had to be 'librarian friendly'. It provided support for basic library functions including check-in, check-out, reserves, report generation and notice generation. The system consisted of ~6500 lines of C code and ran on 11/23 and 8086 based micro-computers with very limited memory (256 - 512 K) and disk space (20 - 40 Meg). It was in daily use at the Carlow College library for over 5 years.

University of Pittsburgh Informal Program

Taught a short course on the basics of the UNIX operating system to a diverse group of professionals.

UNIX Instructor**2/83 - 5/83****Kent State University - East Liverpool, Ohio**

Provided college level instruction of basic programming skills.

Part-time Instructor**2/80 - 6/81****Independent Systems Consultant****12/79-Current**

Engaged in outside consulting for several companies. This experience includes:

Groupware System Consultant**Mitre Corporation****8/93 - 4/94**

Produced a prototype groupware editor for the Mitre Corporation. This editor uses ATK for the user interface and is designed to interface with multiple back-ends to provide concurrent editing across machine and process boundaries. Responsibilities included:

- Working w/ Mitre to define system capabilities and the interface between the front and back ends.
- Development of the ATK user interface to support :
 - Multifont text
 - Various ATK objects (spreadsheets, drawings, animation, etc.).
 - Both manual and automatic check-in / check-out of units.
 - Appropriate user feedback and dialog.
- Development of a file-based back-end to support:
 - Multi-process group interaction on a single machine.
 - Multi-machine group interaction on AFS connected machines.

Other Consulting**12/79-Current**

Worked on a variety of projects including:

- Courseware system development; developed a script language to produce multimedia scripts for CAI.
- Website design and implementation for a local investment firm
- The transfer of several thousand Alcoa documents from paper to an online database format.
- The implementation of a management analysis program on an IBM PC.
- The rewriting of the Free Library of Philadelphia's OCLC records.
- Consulting on the installation of Unix systems.
- The writing of various small business support programs.

Formal Education and Awards

- Certificate of completion for the executive course in Technology Commercialization. CMU/GSIA, 2001
- NETWorth received the Best of the Web Award for 1995 from GNN for best financial site
- Award from ITC for adding new features to ATK text processing and improving printing. 1989
- Award from IBM for work contributing to the deployment of the 6152 workstation. 1988.
- Award from ITC for work on ATK and its deployment to the CMU campus. 1988
- M.S. Information Science. The University of Pittsburgh, Pittsburgh, Pa. 1980
- B.A. Carnegie Mellon University, Pittsburgh, Pa. 1976

Other Interests

Computer music and sound generated graphics: I continue to collaborate with Roger Dannenberg on computer systems to enhance live music performances, including work to generate sound from video and include live video within OpenGL graphics. (see papers below).

Musician: Instruments include mandolin, guitar, bass, hammer dulcimer, and ceramic drums of my own creation.

Latodami Nature Center: Volunteer work on a variety of projects including the development of <http://latodami.org>. During a recent collaboration with the *Moraine Preservation Fund*, I set up a webcam to allow viewing of the barn owls we were helping to raise. These owls were equipped with tracking harnesses and I developed the software to allow their movements to be tracked via Google maps.

Patents, Publications, and Presentations

Method and Apparatus for Information Mining and Filtering. Patent # 6,915,308 granted July 5, 2005. Inventors: David Evans, Michael Horowitz, Chris Lichti, and Thomas Neuendorffer,

Sound Synthesis from Real-Time Video Images by Dannenberg and Neuendorffer in *Proceedings of the 2003 International Computer Music Conference*. San Francisco: International Computer Music Association, (2003), pp. 385-388.

Analysts Workbench – A CAD-like GUI for Textual Search and Filter Creation. A CMU HCI Seminar presentation by Thomas Neuendorffer. November 29, 2000

Low-Latency Interaction through Choice-Points, Buffering, and Cuts in Tactus by Dean Rubine, Roger B. Dannenberg, David B. Anderson, and Tom Neuendorffer; published in Proceedings, IEEE International Conference on Multimedia Computing and Systems '94. 1994.

Tactus: Toolkit-Level Support for Synchronized Interactive Multimedia by Roger B. Dannenberg, Tom Neuendorffer, Joseph M. Newcomer, and Dean Rubine published in Proceedings, Third International Workshop on Network and Operating System Support for Digital Audio and Video November 12-13, 1992 San Diego, California. Sponsored by IEEE Communications & Computer Societies. An expanded version appeared in Multimedia Systems Journal vol.1, no.2, pp. 77-86, 1993.

Andrew a CDROM containing both binaries, source and documentation for the Andrew toolkit and Adew, as well as a variety of papers on the system including several of those listed below. Published by Carnegie Mellon University 1992.

The Resource-Instance Model of Music Representation by Roger B. Dannenberg, Dean Rubine, and Thomas Neuendorffer in Proceedings 1991 International Computer Music Conference, Montreal, Canada, 16 - 20 October 1991.

ADEW A Multimedia Interface Builder for Andrew, Thomas Neuendorffer, in Proceedings Multi-Media Communications, Applications and Technology Workshop, Sydney, Australia, 1-2 July, 1991. The Australian presentation of this paper was made from Pittsburgh using a combination of commercial teleconferencing hardware and a remote X-windows based demo using prototype collaborative work software developed with the ADEW system. Also presented at Bellcore.

Allocation of User-Interface Resources in the Andrew Toolkit, Mark Sherman, D Anderson, W J Hansen, T P Neuendorffer, A J Palay, and Z Stern in Proceedings: International Conference on Multimedia Information Systems '91, 1991.

Creating Andrew Applications. A 3 hour tutorial presented at the Xhibition '89 , '90 , and '91 conferences San Jose, Cal..

Building Hypertext on a Multimedia Toolkit: An Overview of Andrew Toolkit Hypermedia Facilities, Mark Sherman, Wilfred J. Hansen, Michael McInerney, and Tom Neuendorffer, in Hypertext: Concepts, Systems and Applications. Proceedings of the First European Conference on Hypertext, INRIA, France, November 1990.

ATK + 8859 = Multi-Lingual Text and Mail, A Study in Expanding the Andrew Toolkit by Thomas Neuendorffer in Proceeding, European Unix User's Group (EUUG) Conference, Nice, France Fall 1990 .

ADEW, The Andrew Development Environment Workbench. An Overview by Thomas Neuendorffer. First presented at the Third MIT X technical conference. Winter '89. An updated presentation was also made as part of the X Technical Conference Session on Application Builders, January 1991 and again at the Application Builder Video Session for the 7th Annual X Technical Conference.

The Andrew Toolkit - An Overview, by Andrew J. Palay, Fred Hansen, Mike Kazar, Mark Sherman, Maria Wadlow, Thomas Neuendorffer, Zalman Stern, Miles Bader, and Thom Peters. Published in Proceedings USENIX Technical Conference, Winter 1988. Also presented by Tom Neuendorffer at the European Unix User's Group (EUUG) Conference, London, Spring 1988.

Glo - A Tool for Developing Window-Based Programs, by Thomas Neuendorffer. Published in Proceedings USENIX Technical Conference, Winter 1986. Presented by self.