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Dr. Charles Neuhauser

Professional Experience

1994 - Present - Consultant – Neuhauser Associates, Inc. (also dba CTCS)

I am currently providing consulting services to various clients in the field of computer architecture and system design, with particular emphasis on areas related to intellectual property. I also lead engineering teams that perform technical analyses and evaluations.

I have investigated technical issues, developed declarations and testified in a number of cases. With respect to architectural issues this has typically involved the structure of microprocessor and microprocessor based systems, including, among others Intel, AMD and ARM. This has included evaluating the internal structure and operation of these devices. A number of cases have involved various bus interfaces internal and external to these systems, typically related to the interface between the processor and the cross connection of bus systems within the PC environment. Other matters have included caching, EEPROM architecture, FPGA based simulators, floppy disk interfaces, industrial robotics and routers. This work has been performed for clients such as Intel, Hewlett-Packard, Texas Instruments, Intergraph, Scenix, Samsung, Mentor Graphics and Broadcom.

Additionally, I have investigated a number of software systems for the purpose of evaluating potential copying, trade-secret and patent issues. In a number of cases, this involves analysis of the source code and comparison to another body of source code performing a similar function. I have reviewed code related to robotics, games, customer relationship management, CD-ROM controllers, RAID systems and set top boxes (among others). Clients have included MediaTek, Mylex and Texas Instruments.

Other matters I have dealt with relate to evaluating proposals and engineering materials in order to determine their suitability for purchase or to assess the adequacy of a development effort. Tasks have included Internet domain name extensions, control system simulation, microprocessor development and real-time debugging. Clients have included Wind River Systems, ICANN and ISI.

1980-1993 - Vice President of Engineering - Palyn Gould Group

I have managed the hardware and software development of client projects in a wide variety of areas, including:

- Single and multi-chip microprocessors
- Bus to bus interfaces and cache designs
- Scan test interface and support software
- Protocol converters
- High speed interprocessor interfaces

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These activities included determination of client requirements, development of acceptable proposals, scheduling, cost estimation, architectural specification, test, validation and final documentation.

In addition, I was responsible for direct client consultation in a number of areas related primarily to midrange and mainframe architectures, with particular emphasis on emulation, reverse engineering and compatibility. Projects included:

- Communication system and midrange performance analysis
- Comparison of mainframe architectures against the IBM 370
- Mainframe cost estimation
- Specification of architectural extensions
- Design reviews and feasibility studies

Since 1985 I also worked extensively in the area of technical litigation including patent analysis, software copyrights and contract negotiations.

Palyn Gould Group has an international clientele. I provided consultation to many of our clients including IBM, Olivetti, Sperry, Burroughs, Mitsubishi, Amdahl, Intel, Hyundai and Honeywell.

1975-1980 Consultant - Palyn Associates Inc.

During this period I participated in the design and implementation of two emulation engines. One (a 3 MIP ECL processor) was incorporated into the ICL product line as a small business system. The other, a TTL version, was prototyped as an advanced technology project. I developed the architecture for both machines and microcode for the TTL version.

1975-1980 Research Assistant - Stanford University

While completing my doctoral research I designed and developed basic hardware and software of the Stanford Emulation Laboratory. This facility was a platform for general purpose emulation and research into processor architectures. I also developed a fully function PDP-11/05 emulation (including disk I/O) capable of supporting Unix.

1971-1975 Research Assistant - Johns Hopkins University

My research included parallel processing and emulation host architectures. My dissertation "An Emulation Based Analysis of Computer Architecture", made use of the an instrumented emulator to capture various instruction set statistics on the PDP-11 architecture.

1968-1971 Member of Technical Staff - Bell Telephone Laboratories

Initially I assisted in the testing and validation of communication sub-system diagnostics for the #1-ESS/ADF store and forward message switch. Later, I participated in the system design of the #1A-ESS voice switch, particularly in the memory system and automated tape billing subsystem. My Master's degree was obtained under a part-time program sponsored by Bell Laboratories.

Educational Background

B.S.E.E.: University of Notre Dame 1968
M.S.E.E.: Northwestern University 1971
Ph.D.E.E.: The Johns Hopkins University 1980

Publications:

“Emmy - An Emulation System for User Microprogramming,” with M. J. Flynn and R. M. McClure, *Proceedings of the NCC 1975*.

“I/O Device Emulation in the Stanford Emulation Laboratory,” with J. Huck, *Proceedings of Micro 12*, November 1979.

“An Emulation Environment and its Application,” with M. J. Flynn in *Microprogramming and Firmware Engineering Methods*, edited by S. Habib, Van Nostrand Reinhold, 1988.

Charles J. Neuhauser, Ph.D.

Specific Experience Related to Technical Legal Matters

In addition to my experience as a technical manager and implementer, I have undertaken a number of technical legal matters over the last ten years.

Trade Secrets: Usually these have been cases related to hardware or micro-coded designs. The most important aspect is the analysis of trade secrets, their relationship to possible public knowledge and the comparison of engineering documents. Reconstructing the history of a project from employee notebooks and other records is sometimes called for. I have had experience with "clean room" design techniques. Many of these matters have dealt with chip and system design.

Patents: Most patent cases (perhaps 15) I have dealt with have been related to hardware or system architectural features. The level of detail has ranged from the logic level to the complete CPU. Tasks that I have performed include claim analysis, prior art research and application review. I have also reviewed patent portfolios for possible purchase. My work in patent infringement analysis has, at times, involved extensive reverse engineering of hardware and software.

Copyrights: I have undertaken a number of software copyright cases. These usually involve PC-based code written in assembly language or "C." Some cases have involved issues related to specifications. Code I have reviewed was related to CAD, animal pathology tracking, robotic arms, games, graphics, RAID systems, peripheral controllers, terminal emulation, and laser printers.

Contracts: I have assisted in the resolution of several contract disputes of a technical nature. Usually the issue relates to failure to perform to contract guidelines. I have also supported technical business negotiations involving patent licensing and the selection of Internet domain names.

Litigation Support: In all of the above areas, I have directly supported attorneys in technical matters such as deposition preparation, execution and review. In addition, I try to provide simplified explanations and analogies for complex technical issues. I have been deposed a number of times and have testified in Federal and State court on several occasions.

Among others, I have worked with the following firms

Howrey, Simon Arnold, White	-	Houston, Menlo Park
Beck, Redden and Secrest	-	Houston
Brobeck, Phleger and Harrison	-	Menlo Park
Brown & Bain	-	Palo Alto
Cooley, Godward	-	Los Angeles
Fenwick & West	-	Palo Alto
Fish & Richardson	-	Menlo Park
Perkins Coie	-	Phoenix
Irell and Manella	-	Los Angeles
ICANN	-	Los Angeles
Jones, Day et al.	-	Cleveland, Los Angeles, Houston
Latham and Watkins	-	Menlo Park
Morrison & Foerster	-	San Francisco, Palo Alto
O'Melveny and Myers	-	New York
Townsend & Townsend	-	Palo Alto