

Paul Budnik
Creative solutions
to difficult problems

Consultant

Mountain Math Software

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Image and Signal Processing
Parallel Computing

- Led major projects in image and signal processing
- Creative solutions for difficult problems with quality management through project structure and tools that create transparency
- Extensive technical lead and team experience with great written and verbal communication skills.
- Broad and deep experience with a wide range of programming languages and development environments

Experience:

Mountain Math Software, Consultant, 1990 - present

Selected Projects

Improve image enhancement software for video at Trusight Inc. Design and implement a new image processing algorithm based on, but better than, adaptive histogram equalization for Suni Medical Imaging to enhance dental x-rays. Design and develop simulators for MPEG compression chips for Cadence Design Systems. Develop a C compiler (based on GNU code) for DSP Semiconductors' Pine DSP. Design and develop a generic tool for digital signal processing design and development, ObjectProDSP.

Consulting Clients

Aegea Medical, Trusight, Suni Medical Imaging, Vilong, Cadence Design Systems, DSP Group, Clarkspur Design, Octel Communications, Castelle and Zoran

Zoran, 1984 - 1989

Director of Tools Systems, 1988 - 1989

Supervised and contributed to the hardware and software development tools that supported Zoran's family of dedicated DSP VLSI components.

Manager of Software Engineering, 1986 - 1988

Supervised and contributed to the software tools that supported Zoran's family of dedicated DSP VLSI components.

Consultant and DSP Architect, 1984-1986

Designed and developed the complete suite of tools (assembler, simulator and emulator board software interface) for the Zoran Vector Signal Processor.

Tools and Specialized Expertise:

Languages and tools: C++, C, Python, Perl, Fortran, Java, JavaScript, shell scripts, microprocessor and digital signal processor assembly languages.

Operating systems: Linux, Windows, Mac OS X, Solaris.

Specialized technical experience: image and signal processing algorithm and system development and implementation; MPEG chip simulation; graphical user interface design and implementation (Windows, X-Windows on Linux, Mac OS X, wxWidgets); Windows privileged mode programming (added image archiving to USB driver); worked with digital signal processors from Texas Instruments, Zoran, DSP Semiconductors and Clarkspur Design; compiler construction (ported GNU C compiler to a new processor); designed and implemented a partial differential equation application for the pioneering SIMD compute, Illiac IV; compiler development for parallel computing; research in organizing parallel memories.

Education:

B. S. in physics, M. S. and Ph.D. in computer science from the University of Illinois at Urbana-Champaign. Acting Assistant Professor at the University of California at Los Angeles.

Selected Publications and Patent:

Budnik, P., "Emergent Properties of Discretized Wave Equations", *Complex Systems*, Volume **19** Issue 2

Budnik. P., "What is Mathematics About?", *Philosophy of Mathematics Education*, **22** (this paper is also in *Critical Issues in Mathematics Education*, Information Age Publishing, 2009)

Barkan, M., Genusov, A., Granski, M., Budnik, P and Retter, R, U. S. Patent 4802111 on Zoran's Digital Filter Processor

Budnik, P. and Kuck, D. J., "The Organization and Use of Parallel Memories", *IEEE Transactions on Computers*, Volume **C20**, Issue 12 (this paper has been cited over 200 times)