

# BEN PROTHRO

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## OBJECTIVE

To design analog and mixed-signal microelectronics for commercial products and to contribute to advanced integrated circuit development.

## SUMMARY

Analog integrated circuit (IC) designer with a broad range of experience covering nearly all facets of a microelectronic system. Technical experience includes analog/mixed-signal/digital ICs, board-level circuit design, digital signal processing and algorithm design, embedded/real-time processing, top-level application processing, and verification and validation. Other professional experience includes writing proposals, interfacing with customers, preparing briefings, evaluating and selecting proposals for government contracts, and managing contractors.

## TECHNICAL SKILLS

- Considerable experience developing analog and mixed-signal integrated circuits using HSPICE, Cadence design tools, and VHDL. Comfortable with Verilog.
- Experience developing PC boards using Eagle.
- Comfortable with a variety of electronic test equipment including spectrum analyzers, network analyzers, parameter analyzers, and oscilloscopes. Familiar with Labview.
- Extensive experience developing signal processing applications for x86, PowerPC, Xilinx Spartan, and Sparc platforms.
- Very comfortable with numerous procedural and object oriented programming languages including C, C++, Matlab, Visual Basic, Simulink, assembly, HTML, and PHP.
- Advanced experience programming a real-time, multiprocessor machine using various distributed processing techniques.

## EXPERIENCE

### *XYZ Microsystems LLC.*

*Knoxville, TN*

IC Design Consultant, January 2007 – Present.

Designed analog and digital integrated circuits for a very low power microelectronic system. Circuits developed include a crystal oscillator, a phase-locked loop and its sub-circuits, and a Gm-C filter. Defined chip layout and test-board requirements for those circuits. Defined requirements for a custom FPGA board used for a system prototype. Used Matlab to develop algorithms for the system and then implemented those algorithms on the prototype using VHDL.

### *Integrated Circuits and Systems Laboratory, U. of Tennessee ECE Dept.*

*Knoxville, TN*

Ph.D. Student Research Assistant, Advisor: Ben Blalock, Ph.D., June 2005 – Present.

Designed and analyzed analog and mixed signal integrated circuits. Used HSPICE and Cadence to simulate and layout various analog and mixed-signal circuits such as operational amplifiers, sample-and-holds, and reference circuits. Acted as student lead in the development of a 14-bit dual slope ADC. Created and executed test plans. Designed PC boards and discrete circuits to test integrated circuits. Contributed to designs fabricated in SiGe BiCMOS, silicon bulk CMOS, and silicon-on-insulator CMOS processes with minimum feature sizes from 500nm down to 150nm.

***Air Force Research Laboratory, Munitions Directorate***

***Eglin AFB, FL***

Electrical Engineer, May 2000 – Present.

Researched, designed, and developed image and signal processing algorithms for radar and electro-optic systems. Acted as program manager in the development of various signal processing applications. Designed and implemented software for real-time laser radar target recognition systems on a multiprocessor computer using C++. Prepared briefings. Interfaced with customers to define requirements for research projects. Evaluated proposals and selected contractors for research projects.

***Software Concepts Incorporated***

***Duluth, GA***

Software Development Engineer, September 1999 – May 2000.

Jointly developed a software library used to verify and validate the compatibility of a CDMA mobile station to the IS-95B and IS-95A+TSB74 specifications. Solely developed *ScriptCase*, a software automation tool designed to accelerate test script generation. (Visual Basic, MS Visual C++, and MFC were used to develop *ScriptCase*.)

**ACCOMPLISHMENTS**

- Most Outstanding Engineer Award, 1998 (highest ranked senior in the College of Engineering, U. of S. Alabama)
- Outstanding Physics Student Award, 1995, U. of S. Alabama
- Presidential Scholarship recipient, 1994 -1998, U. of S. Alabama
- Jeremy Blanton Memorial Scholarship recipient, 1998, U. of S. Alabama
- Tau Beta Pi, Eta Kappa Nu honor societies
- Awarded assistantship with stipend, 1998, Georgia Institute of Technology
- Professional certificate in Radar Signal Processing and Techniques from Georgia Tech Professional Education
- U.S. Secret security clearance (U.S. citizen) (2000)
- Certified Level I Acquisition Professional (2004)
- Various Special Act and Notable Achievement Awards (AFRL/Munitions Directorate)

**EDUCATION**

***University of Tennessee, Knoxville, TN***

***GPA 3.95/4.0***

Pursuing Ph.D. in Electrical and Computer Engineering, January 2005 - Current.

Coursework requirement was completed December 2006.

Specializing in analog and mixed-signal integrated circuits. Member of *Integrated Circuits and Systems Laboratory*.

***Georgia Institute of Technology, Atlanta, GA***

***GPA 3.82/4.0***

Master of Science in Electrical and Computer Engineering, August 1999.

Specialized in digital signal processing, communications systems, and analog electronics. Project: Developed image processing algorithm to detect nodules in lung x-rays.

***University of South Alabama, Mobile, AL***

***GPA 3.96/4.0***

Bachelor of Science in Electrical Engineering, June 1998.

Senior project: Designed and developed a robotic vehicle which homed on IR signals while navigating an obstacle course.

## **PERSONAL STRENGTHS**

- Able to focus on tedious tasks for long periods of time.
- Very detail oriented.
- Strong entrepreneurial spirit.
- Well rounded: Hobbies include violin, woodworking, and large format nature photography (benprothro.com).
- Easy-going and light-hearted personality.
- Able to quickly acquire new skills.
- Strong writing and presentation skills.

## **PUBLICATIONS/PATENTS**

- Ulaganathan, C.; Nambiar, N.; Prothro, B.; Greenwell, R.; Chen, S.; Blalock, B. J.; Britton, C. L.; Ericson, M. N.; Hoang, H.; Broughton, R.; Cornett, K.; Fu, G.; Mantooth, H. A.; Cressler, J. D.; Berger, R. W., "A SiGe BiCMOS instrumentation channel for extreme environment applications," Circuits and Systems, 2008. MWSCAS 2008. 51st Midwest Symposium on , vol., no., pp.217-220, 10-13 Aug. 2008.
- K. Akarvardar, S. Chen, J. Vandersand, B. Blalock, R. Schrimpf, B. Prothro, C. Britton, S. Cristoloveanu, P. Gentil, and M. M. Mojarradi, "Four-Gate Transistor Voltage-Controlled Negative Differential Resistance Device and Related Circuit Applications," IEEE International SOI Conference, Oct. 2-5, 2006, Niagara Falls, New York, pp. 71-72.
- "Complementary Paired G4FETs as Voltage-Controlled NDR Device," M. Mojarradi, K. Akarvardar, S. Chen, J. Vandersand, R. Schrimpf, B. Blalock, C. Britton, S. Cristoloveanu, B. Prothro, and P. Gentil, July 2006, JPL/NASA Case No. NPO 43929. (*Provisional Patent Application*)