

**Career Focus:** Research, development, & implementation of software, systems, & applications employing DSP (e.g., video, speech, audio, image, wireless data comm., radar), pattern recognition, or related technologies.

## SUMMARY OF QUALIFICATIONS

- Decades of experience in development of wide-ranging signal processing systems, from concepts to products.
- Thirteen years experience as Chief/Principal Scientist of a leading speech technology company.
- Spearheaded the development of a successful, fundamentally new speech recognition technology.
- Self-motivated, optimistic, goal-driven, excellent at speaking, writing, teaching, and presenting.

## EXPERTISE

- DSP (speech, audio, image, video)
- Detection, Estimation, Filtering, Tracking
- Pattern Recognition
- Noise Reduction
- Embedded Systems
- Image Restoration and Enhancement
- Real-Time System Design, Simulation, & Testing
- Signal Compression (incl. Audio & Video Codecs)
- Software Design, Implementation, Testing, Porting
- Telecom Systems & Applications

## TECHNICAL SKILLS

- MATLAB
- Simulink
- C/C++
- Fortran/Pascal
- TI Code Composer
- TIC6x, C54x, C2000
- Verilog
- ModelSim

## PROFESSIONAL HISTORY

**Biamp, Plano, TX – Senior DSP Engineer** Jul 2022-present

Design & implement innovative advanced audio DSP algorithms: e.g. for noise reduction, beamforming microphones, & acoustic echo cancellation. Prepare & design digital audio datasets for DSP & machine deep learning projects. Maintain, manage, and upgrade machine learning infrastructure systems and codebases. Design & implement algorithms for digital audio (speech) feature extraction.

**Texas Instruments Kilby Labs, Dallas, TX – Senior DSP Engineer/Scientist** Mar 2021-Mar 2022

Developed DSP algorithms, software, & embedded systems for optical sensing products (MATLAB, Code Composer).

- Optical sensors
- Optimal detection, estimation & classification
- Low-SNR detection

**Garrett Metal Detectors, Garland, TX – Senior DSP Engineer/Scientist** Aug 2019-Jan 2021

Developed DSP algorithms & software for metal detection products (MATLAB, Code Composer).

- Metal detection systems
- Optimal detection, estimation & classification
- Clustered statistical modeling

**Raytheon Space & Airborne Systems, McKinney, TX – Senior Principal Systems Engineer** Jun 2019-Aug 2019

Developed concepts, systems, DSP algorithms & software for advanced electro-optical systems (MATLAB).

- Electro-optical systems
- DSP algorithms
- Statistical signal science
- Target loc. & DF

**L3 Mission Integration, Greenville, TX – Senior Systems Engineer** Mar 2017-Jun 2019

Developed DSP algorithms, HDL/RTL, & software for electronic intelligence and surveillance systems (MATLAB).

- Radar systems
- Spectral estimation
- Digital mod/demod.
- Interferometry & DF

**Authentix, Inc, Addison, TX – Principal Signal Scientist** Jan 2008-Apr 2015

Developed algorithms and architectures for advanced processing of high-speed multi-spectral images (TI C64x/ C64x+ embedded DSP, C/C++, Code Composer, MATLAB, Scilab, Octave).

- Image enhancement & noise reduc.
- Eigensystem analysis
- Principal components analysis
- Digital modulation (CDMA)
- Detection, estimation, classification
- Multivariate param. optimization

**Aava Technology, LLC, Plano, TX – Member of Technical Staff (Independent Contractor)** July 2007-Jan 2008

Ported and optimized proprietary video codec for TI C64x embedded DSP platforms (C/C++, Code Composer, XDAIS/XDM, DaVinci, XDC, Reference Frameworks, DM642, DM6446, DM648, Scilab, OpenOffice).

- H263, H264, MPEG2, MPEG4
- Wavelet & DCT compression
- Arithmetic & QM codecs

**Crane Wireless Monitoring Solutions, Plano, TX** – *Senior DSP Systems Engineer* 2003-2007

Developed DSP systems, algorithms, HDL/RTL, software, & firmware for adaptive wireless network communication systems (MATLAB, Simulink, Verilog, ModelSim, C/C++, Xilinx, Altera, Lattice).

- Adaptive Array Processing
- Spread-Spectrum Methods
- Interference Suppression
- Digital Beamforming
- TDMA/FDMA/CDMA
- Noise Reduction

**Polycom, Austin, TX** – *Principal Audio Engineer* 2000-2002

Developed algorithms & software for advanced real-time audio signal processing, (C/C++, Win32, Equator, MATLAB).

- Speech Detection
- Acoustic Echo Cancellation
- Source Tracking
- Beamforming
- Compression/Decompression
- Noise Reduction
- Polyphase Filtering
- Adaptive Filtering
- Low-Delay Filtering

**Applied Science Fiction, Austin, TX** – *Senior Engineer* 1999-2000

Developed algorithms and software for advanced real-time photographic image processing. – Developed and supported three major blocks of image processing system on five successive environments including two real-time, multi-processor platforms, and resolved critical image noise questions (C/C++, Win32, Mercury/SAL/Altivec, Unix, MATLAB, IDL, TCL/TK, WiT).

**Wizion.com, Richardson, TX** - *Technology Consultant* (concurrent) 1999-2000

Provided strategic technical direction and support to CEO and engineering staff enabling successful demonstration to seed capital investors.

**DNA Enterprises, Richardson, TX** – *Senior Software Architect* 1997-1999

Led development of architectures, algorithms, and software for real-time signal processing applications. – Real-time OCR for high-speed document inspection & sorting applications (C & C6x asm, Win32, DOS). – PC host software (board configuration, loader, debugger, etc.) for TI C6x EVM (C/C++, Win32). – E1 framer setup & control (Motorola 56k asm). – Signal processing software for programmable telecom switch console (C & 54x asm).

**Voice Control Systems, Dallas, TX** – *Chief Scientist* 1983-1997

Served as: primary technical contributor, consultant, and mentor to R&D staff; chief architect of all major algorithms for discrete & connected speech recognition and speaker verification; principal author of patents; lead algorithm designer during all phases of product development, from initial concepts to final fielded systems. – Developed a fundamentally new speaker-independent speech recognition technology. – Extended technology to speaker-dependent, continuous, and speaker verification applications. – Spearheaded and managed program to radically redesign technology for single-chip implementation. – Continually developed new methods to achieve performance and efficiency improvements, permitting rapid proliferation of technology into new platforms, environments, vocabularies, and languages. – Functioned as the primary consultant in solving critical-path technical problems. – Developed an extensive library of software utilities for graphical/statistical analysis, etc. – Wrote, delivered papers and presentations at technical conferences, trade shows, customer briefings, etc. – Developed algorithms and software for: advanced vector quantization; time-domain and frequency-domain signal measurement design; echo cancellation; noise suppression; fast speech coding; eigensystem analysis; multivariate parameter optimization; signal simulation; automatic in-line source code generation.

**Martingale Research Corporation, Allen, TX** – *Senior Scientist* (concurrent) 1992-1993

Developed concepts & software implementation of digital signal processing & pattern tracking & recognition algorithms, especially for application in the areas of speech & image understanding (C/C++, Fortran, Win32, Labview, MatrixX).

**Texas Instruments, Lewisville, TX** – *Systems Engineer* 1980-1983

Performed systems analysis and conceptual development, especially: image tracking; image restoration; synthetic image sequence generation; subpixel image registration; spatial sampling error modeling and estimation; radar signal detection, location, and identification; multisensor recognition (Fortran, VMS, IMSL).

## EDUCATION

**Southern Methodist University, Dallas, TX**

*PhD Program, Statistical Signal Processing – Completed all phases of program except dissertation*

**Clarkson University, Potsdam, NY**

*B.S.E.E., M.E.E.E. – Thesis on microprocessor-based music technology*