

JOHN F. TILKI III

WORK

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PROFESSIONAL OBJECTIVE

Continue research and development in statistical digital signal processing, with concentrations in adaptive, image, communications, and sensor array signal processing.

EDUCATION

Expected 2001

Ph.D. Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, (GPA: 3.91/4.0), proposed dissertation: "Image Data Compression Using Multiple Bases Representation"

1998

M.S. Electrical Engineering, Virginia Polytechnic Institute and State University, Blacksburg, VA, (graduating GPA: 3.91/4.0), thesis: "Encoding a Hidden Digital Signature Using Psychoacoustic Masking"

1990

B.S. Electrical Engineering, with Highest Distinction, Worcester Polytechnic Institute, Worcester, MA, (graduating GPA: 3.7/4.0)

Major Qualifying Project: "Digital Signal Processing for High-Fidelity Audio Applications." A complete two-channel 16-bit DSP system capable of real-time high fidelity audio processing was designed and built, and DSP software was developed for several sample audio effects and applications.

Interactive Qualifying Project: "Ideology and Political Socialization in Soviet Education"

Sufficiency Project: "Mutual Misperceptions in U.S.-Soviet Relations"

HONORS

Tau Beta Pi; Eta Kappa Nu; Electrical Engineering Department GTA Teaching Award (Virginia Tech, 1991-2 and 1992-3); Certificate of Recognition for Outstanding Teaching (Virginia Tech Graduate School, 1992-3); chosen as a panelist for the GEM Program's 1992 National Videoconference "Graduate School: Paying the Bill"; 1989 WPI Harit Majmudar Research Fellowship; United Technologies Corporation Scholarship 1986-90

EXPERIENCE

2000-present

Senior Software Engineer for DiamondBack Vision, Inc., an internet startup company. Research and development in support of an MPEG-4 video compression solution utilizing computer vision principles to allow TV-quality internet video over 56kbaud modem and other narrowband connections.

1999

Independent consulting work in support of Dr. Jeffrey Reed, who was an expert witness in a court case involving location estimation techniques for cellular emergency-911 calls.

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- 1998-1999 Independent consulting work as DSP Consultants (Dr. A. A. (Louis) Beex and John F. Tilki). Clients have included:
- Digital System Resources, Inc., McLean, VA, for whom we perform reviews of proposed digital acoustic signal processing techniques and algorithms.
 - Measurement Division of American Electric Power, Roanoke, VA, for whom we evaluated the effects of under-sampled harmonic signals when estimating delivered power with a prototype measurement device.
- 1999-2000 Virginia Tech – Programming consultant for the Bradley Department of Electrical and Computer Engineering for the Matlab programming language.
- 1998-1999 Virginia Tech – Research Associate under Dr. A. A. (Louis) Beex, funded by CrossMedia Corporation through the Center for Wireless Telecommunications. We investigated the effects of environment noise and cellular phone channel degradation on speech recognition performance in an automated email retrieval system. A software package for modeling and simulation was produced as a contract deliverable.
- 1998 Virginia Tech – Senior Graduate Research Assistant under Dr. A. A. (Louis) Beex, funded by Digital System Resources, Inc. We developed a simulation software package that performs various signal-processing functions on low-frequency underwater acoustical signals. DSR plans to use the software in proof-of-concept demonstrations when pursuing additional related research grants.
- 1995-1997 Virginia Tech - Senior Graduate Research Assistant under Dr. A. A. (Louis) Beex, funded by Interactive Return Services, Inc., Grupo PISA, and the Center for Wireless Telecommunications. The project involved encoding a hidden digital signature onto the analog audio component of a television signal. The hidden code is relatively imperceptible to human observers yet easily detectable by an inexpensive, DSP-based, interactive television device, which was designed, built, and programmed. The encoding scheme is also robust to extraneous room noise and the wow and flutter of videotape machines.
- 1995 Virginia Tech - Graduate Research Assistant under Dr. A. A. (Louis) Beex, funded by SYSCON Corporation. The project objective was target location estimation by matched field processing and source spectral estimation for shallow water acoustic array signals.
- 1993-1994 Virginia Tech - Graduate Research Assistant under Dr. A. A. (Louis) Beex, funded by IBM Federal Systems Division and the Center for Innovative Technology. The research focus was parametric spectral modeling and reconstruction of periodic acoustic signals buried in wideband colored noise, for the purpose of sensor array signal enhancement.
- 1990-1993 Virginia Tech - Teaching Assistant for the following courses:
- EE 2006: Network Analysis II
 - EE 2204: Electronics I
 - EE 3054: Electrical Theory
 - EE 4004: RC Active Filter Design
 - EE 4624: Introduction to Signal Processing
 - EE 5624: Digital Signal Processing I
 - EE 5984: Digital Communications

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PRESENTATIONS *Simulation Tool for Speech Recognition Over Wireless*, poster presentation at the 9th Virginia Tech MPRG Symposium on Wireless Personal Communications, Blacksburg, VA, June 2-4, 1999. (James Hicks, Pulakesh Roy, John Tilki, A. A. Beex, Jeffrey Reed, Willard Farley)

DSP Fundamentals, and Average Power Evaluation, workshop given to the Measurement Division of American Electric Power, Roanoke, VA, September 8, 1997. (DSP Consultants: A. A. Beex and John F. Tilki)

Encoding a Hidden Digital Signature onto an Acoustic Signal Using Psychoacoustic Masking, Signals and Systems Seminar, Virginia Tech, Blacksburg, VA, January 24, 1997. (John F. Tilki and A. A. Beex)

Parametric Modeling and Reconstruction of Acoustic Signals, Signals and Systems Seminar, Virginia Tech, Blacksburg, VA, February 3, 1995. (John F. Tilki and A. A. Beex)

Multiple Bases Representation, Quantization, Coding, and Reconstruction, Signals and Systems Seminar, Virginia Tech, Blacksburg, VA, April 23, 1993. (John F. Tilki and A. A. Beex)

PATENTS

Multilayered and Multipath Thin Film Phase Control Materials for Near Real Time Signal Processing, Virginia Tech Intellectual Properties, Inc., Disclosure #00-058, July 26, 2000. (John F. Tilki, Igor A. Kostic, Richard Claus)

A Generalized Method of Encoding a Hidden Digital Signature onto an Audio Signal Using Psychoacoustic Masking, Virginia Tech Intellectual Properties, Inc., Disclosure #99-022, June 16, 1999. (A. A. Beex and John F. Tilki)

Adding a Hidden Auxiliary Channel onto a Digital Audio Signal Using Psychoacoustic Masking, Virginia Tech Intellectual Properties, Inc., Disclosure #97-010, February 2, 1997. (A. A. Beex and John F. Tilki)

Encoding a Hidden Digital Signature onto an Audio Signal Using Psychoacoustic Masking, Virginia Tech Intellectual Properties, Inc., Disclosure #96-079, October 14, 1996. (A. A. Beex and John F. Tilki)

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COURSES

Relevant courses taken at Virginia Tech:

EE4405: Control Systems
EE4604: Applied Spectral Analysis and Filtering
EE4624: Introduction to Signal Processing
EE5015: Network Synthesis and Design
EE5554: Theory and Design of Computer Vision Systems
EE5605: Stochastic Signals and Systems
EE5606: Stochastic Signals and Systems II
EE5624: Digital Signal Processing I
EE5644: Optimal Discrete Time Filtering and Robust Estimation
EE5704: Linear System Theory
EE5714: Robust Estimation and Filtering
EE6604: Adaptive Signal Processing
EE6604: Speech Processing
EE6624: Digital Signal Processing II
EE6714: System Identification
MATH4425: Fourier Series and Partial Differential Equations
MATH4446: Introduction to Numerical Analysis
MATH4574: Vector and Complex Analysis for Engineers
MATH5524: Matrix Theory

Also, I was an instructor or teaching assistant for the following relevant graduate-level courses (please see the **EXPERIENCE** section above for a full listing):

EE 4004: RC Active Filter Design
EE 4624: Introduction to Signal Processing
EE 4684: Digital Signal Processing Laboratory
EE 5624: Digital Signal Processing I
EE 5984: Digital Communications

COMPUTER SKILLS

Extensive experience with C, C++, Matlab, Assembly, Pascal, FORTRAN, BASIC, CADAM, computer architecture, MS-DOS, Windows, VAX/VMS, Unix, X-Windows, local area networks, system administration.

ACTIVITIES

Virginia Tech -- lab and systems manager for the Digital Signal Processing Research Laboratory (1992-2000); Radford High School Mentor Program for Talented and Gifted Students (1994-9); graduate student representative to the Electrical Engineering Department's Graduate Advisory Committee (1993-6); Electrical Engineering Department representative to the College of Engineering Graduate Student Committee (1993-5); Scuba Club; Astronomy Club; Motorcycle Club; weightlifting; racquetball; golf; running; home beer brewing; guitar; selected philanthropies: American Diabetes Association Walk for Diabetes, American Heart Association Telethons, American Cancer Society Relay for Life.

WPI -- Sigma Phi Epsilon Fraternity, Social Chairman; IEEE; Scuba Club; Worcester, MA and Pushkin, USSR Sister City Exchange Program; intramural sports; various philanthropies.

REFERENCES

Available upon request.