Steven K. Tjoa

Department of Electrical and Computer Engineering, University of Maryland
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Education

Ph. D., Electrical Engineering   University of Maryland · College Park, MD · 1/2007–present

Advisor: Prof. K. J. Ray Liu (IEEE Fellow, IEEE Signal Processing Soc. President-Elect).

Passed the research proposal exam. Advanced to candidacy.

Passed the written (Score: 92.5/100; Passing Score: 55.5/100) and oral qualifying examinations.

M. S., Electrical Engineering   University of Maryland · College Park, MD · 8/2004–12/2006

Advisor: Prof. K. J. Ray Liu.

Scholarly Paper: "Digital Image Source Coder Identification: A Non-Intrusive Forensic Methodology"

B. S., Computer Engineering   University of Maryland · College Park, MD · 8/2000–5/2004

University Honors Program. Citation in Music Performance. UM Symphony Orchestra.

Honors and Awards

ECEGSA Best Student Speaker, 2010 (awarded to two ECE graduate students)

ECE TA Training and Development Fellow, 2010

ECE Graduate Student Service Award, 2008 (awarded to one ECE graduate student)

UMD Graduate Student Summer Research Fellowship, 2008 (awarded to fifty-six UMD graduate students)

Lilly Conference Travel Grant, 2008

UMD Future Faculty Fellow, 2008 (awarded to twenty UMD engineering graduate students)

George Corcoran Memorial Award, 2007 (awarded to one ECE graduate student)

UMD Distinguished Teaching Assistant, 2007

UMD Dept. of Resident Life Community Assistant of the Year, 2002

UMD Presidential Scholarship, 2000

ECE Departmental Scholarship, 2000

Edward J. Bloustein Distinguished Scholar: New Jersey, 2000

New Jersey Governor's School of the Arts, 1999

MENC All-Eastern Orchestra: Carnegie Hall, New York, 1999

Research Experience

Research Assistant, Dept. of ECE   University of Maryland · College Park, MD · 6/2005–present

Developed dictionary learning and sparse coding methods for *music information retrieval* tasks such as transcription, source separation, instrument recognition, and more.

Devised novel forensic methods to *detect traces of compression in digital images* based solely upon information intrinsic to the image. Developed a system which can classify the method of compression used upon an image by examining the artifacts caused by image pre-processing, transformation, and quantization.

Received a *Graduate Student Summer Research Fellowship* from the Graduate School for 2008.

Research Assistant, Dept. of ECE   University of Maryland · College Park, MD · 1/2003–8/2003

Implemented an indoor location system using a four-antenna array for synchronous data collection following the IEEE 802.11b standard.

Programmed FPGAs in VHDL. Wrote API programs in C. Applied frequency estimation algorithms in Matlab.

Teaching Experience

Co-lecturer, ENEE322   University of Maryland · College Park, MD · Fall 2009

Lectured ENEE322: Signal and System Theory (forty-eight students) for 33% of the Fall 2009 semester. Designed lesson plans, homework assignments, and exams.

Mentored two teaching assistants. Held regular office hours and review sessions. Graded exams.

Selected Student Feedback: "The techniques used by Steve work very well for me." "really great balance between theory and examples." "good balance between theory and examples." "extremely well-taught course." "seemed genuinely interested in helping students." "very approachable!" "has motivated me to branch into DSP." "has been my best class this semester." "Awesome class!!! my favorite this semester."

Teaching Assistant, ENEE408G   University of Maryland · College Park, MD · 1/2006–5/2008

Taught ENEE408G: Multimedia Signal Processing over five semesters (fifty-seven students total). Administered four design projects per semester. Assisted with final semester projects, providing directions for research.

Also mentored four groups (twenty students total) in Spring 2010 on final semester projects related to music information retrieval.

Coauthored various assignments and programming guides. Held regular office hours and graded lab reports.

Received the *George Corcoran Memorial Award* from the Department of Electrical and Computer Engineering for the 2006-2007 academic year.

Received a *Distinguished Teaching Assistant Award* from the Center for Teaching Excellence.

Received a travel grant to the *Lilly-East Conference on College and University Teaching.*

Teaching Assistant, ENEE241   University of Maryland · College Park, MD · Fall 2007, Fall 2010

Taught ENEE241: Numerical Techniques in Engineering over two semesters (thirty-seven students total).

Held regular office hours. Graded homework assignments and exams.

Teaching Assistant, ENEE428   University of Maryland · College Park, MD · Fall 2005

Taught one section (four students) of ENEE428: Communications Design Laboratory. Assisted students with DSP programming of the TI TMS320C6701. Administered lab assignments.

Held office hours and graded lab reports for both sections (sixteen students).

Honors 100 Section Leader   University of Maryland · College Park, MD · Fall 2002

Taught a weekly honors seminar (fourteen students), HONR100, as part of the University Honors Program. Introduced college freshmen to the qualities of a liberal education (e.g., diversity, current events, community service, arts), and helped them facilitate the transition from high school to college (e.g., academic planning, campus resources).

Selected Student Feedback as TA

"Best TA I've had in EE. Knows material well, explains concepts well." "by far the best TA I ever had at UMD." "great understanding of the subject." "very friendly and approachable." "offers insight and suggestions." "always full of energy." "enthusiastic." "well organized, conveyed concepts clearly." "understands student's needs and difficulties." "fair and sincere." "communicates well." "one of the most dedicated TAs I've had." "one of the most helpful TAs I've come across." "extremely helpful at all times and motivates you to do good work in lab." "holds additional office hours and is very fair at grading reports."

Professional Experience

Intern, Satellite Management Systems   Intelsat · Washington, DC · 6/2004–8/2004

Performed software tests on telemetry and flight dynamic commanding for Loral Ground Network Systems integration. Assisted with maintenance of software documentation.

Intern, Satellite Engineering   Intelsat · Washington, DC · 6/2002–11/2002

Performed software and database testing for the IS-X satellite series. Revised acceptance test plans and software requirement specifications.

Service and Leadership Activities

Coordinator, Entrepreneurial Activities   U. of Maryland · College Park, MD · 9/2009–present

Helped organize colloquia and social events related to entrepreneurship.

Graduate Dean's Student Advisory Committee   U. of Maryland · College Park, MD · 1/2008–present

Advised the Graduate Dean on matters related to graduate student academic life at the University of Maryland including assistantship policy, mentoring, entrepreneurship, ethics, career placement, inter-departmental collaboration, awards and recognition, revision of the UMD Strategic Plan, renovations, and more.

Was invited for membership by nomination.

President, ECEGSA   University of Maryland · College Park, MD · 7/2007–6/2008

Led the Electrical and Computer Engineering Graduate Student Association (ECEGSA), an organization that unites the ECE graduate student body through social, academic, and professional activities.

Managed a board of nine graduate students. Communicated regularly with a graduate student body of over 400. Served as the primary interface between the graduate students and faculty, staff, industry, and professional organizations.

Organized and moderated weekly research seminars, panel discussions, and award ceremonies.

Organized such social events as hiking, skiing, barbecues, weekly coffee hours, and more.

Received the *Graduate Student Service Award* from the Department of Electrical and Computer Engineering for the 2007-2008 academic year.

Lab Manager   University of Maryland · College Park, MD · 6/2007–present

Handled everyday concerns related to the Multimedia Signal Processing Laboratory, including computer maintenance, item inventory, and lab organization.

Designed, created, and maintained the Signals and Information Group web site.

Volunteer, Laboratory Demonstrations   University of Maryland · College Park, MD · 4/2006–present

Volunteered during several demonstrations in the Multimedia Signal Processing Laboratory, including Maryland Day 2006-2010 and many others.

Spoke in front of general audiences. Assisted with hands-on demonstrations.

Conference Volunteer   Various international conferences

Performed administrative tasks at IEEE ICASSP 2007 and ISMIR 2008.

Helped grade the MIREX 2010 contest at ISMIR 2010.

Community Assistant, Dept. of Resident Life   Univ. of Maryland · College Park, MD · 8/2001–8/2002

Provided customer service to students, parents, staff, and faculty within the UMD community. Maintained security of keys and packages within North Hill resident halls.

Received an award for *Community Assistant of the Year* for the 2001-2002 academic year.

Reviewer Activities

Journals IEEE J. Selected Topics in Signal Processing, IEEE Trans. Information Forensics and Security, IEEE Signal Processing Letters, SPIE J. Electronic Imaging.

Conferences IEEE ICIP (2008, 2010), IEEE ICASSP 2008, IEEE ICCCAS 2006.

Invited Talks

"Make It Stick: Get Students to Remember Your Message," University of Maryland, College Park, MD, October 27, 2010. Workshop for graduate ECE teaching assistants. Selected feedback: "I like Steve's workshops, he's good." "Very helpful." "Really useful and interesting." "Informative and very easy to listen to." "That's what every TA needs to know."

"Factorizing Bach: Recent Convergences Between Music and Machines," University of Maryland, College Park, MD, February 19, 2010. ECEGSA seminar on music information retrieval. Earned an *ECEGSA Best Student Speaker Award* for 2009-10.

"Public Speaking: Conquering your fears through practice," University of Maryland, College Park, MD, March 5, 2009. Workshop for graduate ECE teaching assistants.

"Time Management for Teaching Assistants: There is Not Enough Time in the Day," University of Maryland, College Park, MD, October 16, 2008 and March 8, 2010. Workshop for graduate ECE teaching assistants.

Graduate Coursework

Signal Processing Advanced Digital Signal Processing, Digital Image Processing, Space-Time Signal Processing (A+), Statistical Pattern Recognition (A+), Pattern Recognition in Temporal Data, Auditory Scene Analysis (A+)

Communications Random Processes, Information Theory, Estimation and Detection Theory, Random Graphs

Optimization and Controls System Theory, Optimal Control, Advanced Numerical Optimization, Convex Optimization (A+), Networked Control Systems, Foundations of Optimization

Computing Numerical Analysis, Digital Computer Design, Real-Time Collision Detection

Future Faculty Program Seminar I/II/III, Teaching Practicum (A+)

Computer Skills

Languages Python (favorite), C, Java, Matlab, Perl, PHP, HTML/XML

OSs, Servers, Databases Unix, Linux, Apache, Cherokee, MySQL, SQLite

Hardware TI TMS320C6701 EVM

Web Site Development

Signals and Information Group, 8/2005 – present (http://www.cspl.umd.edu/sig/)

ENEE408G, Spring 2006 – Spring 2007 (http://www.ece.umd.edu/class/enee408g.S2007/)

IEEE Journal on Selected Areas in Communications, special issue on Cooperative Communications and Networking, 9/2005 – 8/2006 (http://dsplab.eng.umd.edu/jsac-ccn/)

Language Media Services, 9/2004 – 8/2005 (http://www.languages.umd.edu/langctr/lms/)

Miscellaneous

Born in New Jersey, USA. United States citizen.

Studied violin under Ms. Ayako Hosoi (formerly w/ New Jersey SO) and Dr. James Stern (U. Maryland).