ZACHARY CHANCE

PERSONAL INFORMATION

email   zachary.chance@ll.mit.edu

phone   (W) (781) 981 1993 · (M) (317) 490 3852

WORK EXPERIENCE

2012–Present   Technical Staff, MIT LINCOLN LABORATORY

MIT Lincoln Laboratory

· Led multiple engineering teams developing algorithms for radar signal processing, multisensor-multitarget tracking, mission planning, and target classification
· Transitioned several solutions to government/contractor teams and fostered successful implementation into fielded systems
· Composed and delivered presentations and reports regularly to give progress updates, summarize work, and exhibit results
· Presented routinely to sponsors and management at all different technical levels, i.e., low-level to executive-level program managers
· Mentored numerous new staff, interns, and military cadets through short-term projects and onboarding periods
· Coordinated and led development for open source tools to aide in the simulation, evaluation, and design of algorithms in the field of adaptive sensing
· Oversaw data engineering effort for the consolidation and organization of large stores of diverse historical data to aide in the development and test of artificial intelligence algorithms
Reference: Paula DONOVAN · (781) 981 2126 · pjdonovan@ll.mit.edu
Reference: Sung-Hyun SON · (781) 981 7307 · sson@ll.mit.edu

2011-2012   Research Assistant, PURDUE UNIVERSITY

Purdue University

· Investigated the incorporation of noisy feedback information in physical-layer communications and proved its tangible utility
· Composed multiple technical articles in the area of feedback communications
· Collaborated with several other research assistants on theoretical development, testing, and technical documentation
· Studied the area of radar waveform design for imaging purposes and composed two conference papers on the subject
Reference: David LOVE · (765) 981 0779 · djlove@purdue.edu

Fall 2011   Student Intern, MIT LINCOLN LABORATORY

MIT Lincoln Laboratory

· Completed two studies on the optimal use of radar resources for the purposes of searching/tracking and the application of compressive sensing techniques to radar imaging
· Wrote technical articles for each corresponding project
· Constructed and presented final reports on the work
Reference: Sung-Hyun SON · (781) 981 7307 · sson@ll.mit.edu

Spring 2011   Student Intern, NAVAL RESEARCH LABORATORY

Naval Research Laboratory

· Formulated the framework for the optimization of radar waveforms with the goal of imaging
· Built appropriate simulation environment to demonstrate the benefits of waveform optimization
· Composed a technical article and presented final report on the subject
Reference: Raghu G. RAJ (202) 767 3662 · raghu.raj@nrl.navy.mil

EDUCATION

	2007-2012 Purdue University, West Lafayette
Doctor of Philosophy	GPA: 3.91 · School of Electrical and Computer Engineering Area of Concentration: *Communications and Signal Processing* Thesis: *Harnessing the Benefits of Noisy Feedback* Advisor: Prof. David J. Love
	2003-2007 Purdue University, West Lafayette
Bachelor of Science	GPA: 3.92 · School of Electrical and Computer Engineering

PUBLICATIONS

FUSION

July 2024 Adaptive temporal decorrelation of state estimates
Reference: *Proceedings of 2024 27th International Conference on Information Fusion (FUSION)*, July 2024

Authors: Zachary CHANCE

MSS Tri-Service Radar Symposium

Nov 2021 Differentiable point scattering models for efficient radar target characterization
Reference: *Proceedings of MSS Tri-Service Radar Symposium*, November 2021

Authors: Zachary CHANCE, Adam KERN, Arianna BURCH, Justin GOODWIN

Signal Processing, Sensor Fusion, and Target Recognition

Aug 2018 Error statistics of bias-näive filtering in the presence of bias
Reference: *Proceedings of Signal Processing, Sensor Fusion, and Target Recognition*, vol. 10646. SPIE, April 2018

Authors: Zachary CHANCE, Stephen RELYEA, Evan ANDERSON

NFCS

Feb 2018 Stable extended target Kalman filter
Reference: *Proceedings of National Fire Control Symposium*, February 2018

Authors: Zachary CHANCE, Stephen RELYEA

MITLL Project Report

March 2018 Sensor placement analysis for defense against uncertain raids of ballistic threats
Reference: *MIT Lincoln Laboratory Project Report MD-51*, pp. 1–56, March 2018

Authors: Zachary CHANCE, Steven R. VOGL, Lori LAYNE

MITLL Technical Report

Dec 2017 Consistent state estimation for very long-range radars
Reference: *MIT Lincoln Laboratory Technical Report TR-1184*, December 2017

Authors: Jason COOKSON, Zachary CHANCE, Leonardo URBANO

IEEE Transactions on Communications

Aug 2015 Concatenated coding using linear schemes for Gaussian broadcast channels with noisy channel output feedback
Reference: *IEEE Transactions on Communications*, vol. 63, no. 11, pp. 4576–4590, November 2015

Authors: Ziad AHMAD, Zachary CHANCE, David J. LOVE, Chih-Chun WANG

Authors: Zachary Chance, Lori Layne, Sung-Hyun Son

Authors: Zachary Chance, Lori Layne, Sung-Hyun Son

IEEE Transactions on Communications	*Dec 2013*	**Noncoherent trellis coded quantization: A practical limited feedback technique for massive MIMO systems** Reference: *IEEE Transactions on Communications*, vol. 61, no. 12, pp. 5016–5029, December 2013 Authors: Junil CHOI, Zachary CHANCE, David J. LOVE, Upamanyu MADHOW
ITA	*Feb 2013*	**Noncoherent trellis-coded quantization for massive MIMO limited feedback beamforming** Reference: *Proceedings of Information Theory and Applications Workshop*, pp. 1–6, February 2013 Authors: Junil CHOI, Zachary CHANCE, David J. LOVE, Upamanyu MADHOW
IEEE Transactions on Signal Processing	*Aug 2012*	**Using channel output feedback to increase throughput in hybrid-ARQ** Reference: *IEEE Transactions on Signal Processing*, vol. 60, no. 12, pp. 6465–6480, August 2012 Authors: Mayur AGRAWAL, Zachary CHANCE, David J. LOVE, Venkataramanan BALAKRISHNAN
WDD	*Jan 2012*	**Waveform design for multistatic radar imaging using mutual information** Reference: *Proceedings of International Waveform Diversity and Design Conference*, pp. 1–4, January 2012 Authors: Zachary CHANCE, Raghu G. RAJ, David J. LOVE
ACSSC	*Nov 2011*	**A sparse Bayesian approach to multistatic radar imaging** Reference: *Proceedings of Asilomar Conference on Signals, Systems, and Computers*, pp. 2107–2110, November 2011 Authors: Raghu G. RAJ, Zachary CHANCE, David J. LOVE
IEEE Transactions on Information Theory	*Oct 2011*	**Concatenated coding for the AWGN Channel with noisy feedback** Reference: *IEEE Transactions on Information Theory*, vol. 57, no. 10, pp. 6633–6649, October 2011 Authors: Zachary CHANCE, David J. LOVE
IEEE Radar Conference	*May 2011*	**Information-theoretic structure of multistatic radar imaging** Reference: *Proceedings of IEEE Radar Conference*, pp. 853–858, May 2011 Authors: Zachary CHANCE, Raghu G. RAJ, David J. LOVE
IWSPWC	*May 2011*	**A hybrid-ARQ protocol using channel output feedback** Reference: *Proceedings of IEEE International Workshop on Signal Processing Advances in Wireless Communications*, San Francisco, CA, USA, pp. 31–35, June 2011 Authors: Zachary CHANCE, Mayur AGRAWAL, David J. LOVE, Venkataramanan BALAKRISHNAN

ICASSP	*Mar 2010*	A noisy feedback encoding scheme for the Gaussian channel

Reference: *Proceedings of IEEE International Conference on Acoustics, Speech, and Signal Processing*, pp. 3482–3485, March 2010

Authors: Zachary CHANCE, David J. LOVE

ACSSC	*Nov 2009*	On linear processing in AWGN channels with feedback

Reference: *Proceedings of Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, USA, pp. 986–990, November 2009

Authors: Zachary CHANCE, David J. LOVE

PROFESSIONAL MEMBERSHIP AND SERVICE

2008–Present · Active Reviewer for IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on Communications, IEEE Transactions on Signal Processing, IEEE Transactions on Wireless Communications

2008–Present · Active Member of IEEE Signal Processing Society, IEEE Information Theory Society, and IEEE Aerospace and Electronic Systems Society

2010–Present · Technical Program Committee Member for GlobeCOM, MILCOM, ICCVE, ISIT, ICASSP

2017–Present · Instructor for Introduction to Radar Course (Internal and External), State Estimation and Data Association Course (Internal)

2020–Present · Lead Instructor for Introduction to Radar Course (External)

OTHER INFORMATION

Awards	2023 · Morale and Spirit Award
	2021 · Presentation of the Year
	2010, 2011, 2012 · Frederic R. Muller Scholarship
	2007 · Ross Fellowship
	2004 · Schlumberger Scholarship
	2004 · Tellkamp-Bostater-Lawrence-Power Scholarship
	2003 · Mary Bryan Scholarship

June 2, 2024