

ZACHARY CHANCE

PERSONAL INFORMATION

email zachary.chance@ll.mit.edu
phone (W) (781) 981 1993 · (M) (317) 490 3852

WORK EXPERIENCE

*MIT Lincoln
Laboratory*

2012–Present Technical Staff, 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

Purdue University

2011–2012 Research Assistant, PURDUE UNIVERSITY — West Lafayette

- 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

*MIT Lincoln
Laboratory*

Fall 2011 Student Intern, 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

*Naval Research
Laboratory*

Spring 2011 Student Intern, NAVAL RESEARCH LABORATORY — Washington, D.C.

- 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

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

PUBLICATIONS

<i>MSS Tri-Service Radar Symposium</i>	Nov 2021	Differentiable point scattering models for efficient radar target characterization Reference: <i>Proceedings of MSS Tri-Service Radar Symposium</i> , November 2021 Authors: Zachary CHANCE, Adam KERN, Arianna BURCH, Justin GOODWIN
<i>Signal Processing, Sensor Fusion, and Target Recognition</i>	Aug 2018	Error statistics of bias-naïve filtering in the presence of bias Reference: <i>Proceedings of Signal Processing, Sensor Fusion, and Target Recognition</i> , vol. 10646. SPIE, April 2018 Authors: Zachary CHANCE, Stephen RELYEA, Evan ANDERSON
NFCS	Feb 2018	Stable extended target Kalman filter Reference: <i>Proceedings of National Fire Control Symposium</i> , February 2018 Authors: Zachary CHANCE, Stephen RELYEA
<i>MITLL Project Report</i>	March 2018	Sensor placement analysis for defense against uncertain raids of ballistic threats Reference: <i>MIT Lincoln Laboratory Project Report MD-51</i> , pp. 1–56, March 2018 Authors: Zachary CHANCE, Steven R. VOGL, Lori LAYNE
<i>MITLL Technical Report</i>	Dec 2017	Consistent state estimation for very long-range radars Reference: <i>MIT Lincoln Laboratory Technical Report TR-1184</i> , December 2017 Authors: Jason COOKSON, Zachary CHANCE, Leonardo URBANO
<i>IEEE Transactions on Communications</i>	Aug 2015	Concatenated coding using linear schemes for Gaussian broadcast channels with noisy channel output feedback Reference: <i>IEEE Transactions on Communications</i> , vol. 63, no. 11, pp. 4576–4590, November 2015 Authors: Ziad AHMAD, Zachary CHANCE, David J. LOVE, Chih-Chun WANG
<i>MITLL Project Report</i>	Feb 2014	On the blind fusion of Bayesian classification information Reference: <i>MIT Lincoln Laboratory Project Report MD-40</i> , pp. 1–33, December 2013 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 SERVICE

- 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)
- 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

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

November 3, 2023