

# Marc Lichtman

## Curriculum Vitae

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### Education

- 2012 — 2016 **Ph.D., Electrical Engineering, Virginia Tech, Blacksburg, VA.**
  - Advisor: Dr. Jeffrey H. Reed
  - Dissertation Topic: Antifragile Communications
  - Areas of Interest: Electronic Warfare, Machine Learning, LTE and LTE Advanced
  - Course work included: communication system design/theory/analysis/simulation, digital signal processing, stochastic signals and systems, machine learning, MIMO
- 2011 — 2012 **M.S., Electrical Engineering, Virginia Tech, Blacksburg, VA.**
  - Advisor: Dr. Jeffrey H. Reed
- 2007 — 2011 **B.S., Electrical Engineering, Virginia Tech, Blacksburg, VA.**

### “Tool Belt”

Python GNU Radio USRPs Keras TensorFlow PyTorch scikit-learn C++ Django  
Git Docker DSP MATLAB L<sup>A</sup>T<sub>E</sub>X

### Experience

- 2016 — 2016 **Research Engineer, Vencore Labs, College Park, MD.**
- 2012 — 2016 **Graduate Research Assistant, Virginia Tech, Blacksburg, VA.**
- Summer 2014 **Research Electronics Engineer, Air Force Research Lab., Albuquerque, NM.**
- Summer 2013 **Instructor, Virginia Tech, Blacksburg, VA.**
- Fall 2011 **Graduate Teaching Assistant, Virginia Tech, Blacksburg, VA.**
- Summer 2011 **Engineering Graduate Intern, GE Energy, Salem, VA.**
- Summer 2010 **Engineering Intern, Overlook Systems Technologies, Vienna, VA.**
- Summer/Fall 2009 **Engineering Co-op, Lutron Electronics, Coopersburg, PA.**
- Summer 2008 **Undergraduate Researcher, Virginia Tech, Blacksburg, VA.**

## Publications

[Link to Google Scholar Profile](#)

1. M. Lichtman, R. Rao, V. Marojevic, J. H. Reed, R. P. Jover, "5G NR Jamming, Spoofing, and Sniffing: Threat Assessment and Mitigation," *IEEE International Conference on Communications (ICC)*, May 2018.
2. M. Lichtman, T. C. Clancy, J. H. Reed, "FSK-Based Reactive Jammer Piggybacking," *IEEE Communications Letters*, 2016.
3. M. Lichtman, T. C. Clancy, J. H. Reed, "Reactive Jammer Piggybacking: Achieving Antifragile Electronic Warfare," *IEEE Military Communications Conference (MILCOM)*, 2016.
4. M. Lichtman, M. T. Vondal, T. C. Clancy, J. H. Reed, "Antifragile Communications," *IEEE Systems Journal*, 2016.
5. M. Lichtman, R. P. Jover, M. Labib, R. Rao, V. Marojevic, J. H. Reed, "LTE/LTE-A Jamming, Spoofing, and Sniffing: Threat Assessment and Mitigation," *IEEE Communications Magazine*, April 2016.
6. M. Lichtman, J. Poston, S. Amuru, C. Shahriar, T. C. Clancy, R. M. Buehrer, J. H. Reed, "A Communications Jamming Taxonomy," *IEEE Security & Privacy*, Feb. 2016.
7. M. Lichtman, J. H. Reed, "Anomaly-Based Intrusion Detection of Protocol-Aware Jamming," *IEEE Military Communications Conference (MILCOM)*, Oct. 2015.
8. M. Lichtman, J. H. Reed, "Analysis of Reactive Jamming against Satellite Communications," *International Journal of Satellite Communications and Networking*, May 2015.
9. M. Lichtman, T. Czauski, S. Ha, P. David, J. H. Reed, "Detection and Mitigation of Uplink Control Channel Jamming in LTE," *IEEE Military Communications Conference (MILCOM)*, Oct. 2014.
10. J. Kakar, K. McDermott, V. Garg, M. Lichtman, V. Marojevic, J. H. Reed, "Analysis and Mitigation of Interference to the LTE Physical Control Format Indicator Channel," *IEEE Military Communications Conference (MILCOM)*, Oct. 2014.
11. M. Lichtman, J. Peck, V. Arellano, J. H. Reed, T. C. Clancy, "An Electronic Warfare Perspective of LTE" *IEEE Military Communications Conference (MILCOM) ITAR/FOUO Program*, Oct. 2014.

12. M. Lichtman, J. H. Reed, "Reinforcement Learning for Reactive Jamming Mitigation," *Journal of Cyber Security and Mobility*, July 2014.
13. C. Shahriar, M. La Pan, M. Lichtman, T. Clancy, R. McGwier, R. Tandon, S. Sodagari, J. Reed, "PHY-Layer Resiliency in OFDM Communications: A Tutorial," *IEEE Communications Surveys & Tutorials*, Aug. 2014.
14. S. Dudley, W. C. Headley, M. Lichtman, E. Imana, X. Ma, M. Abdelbar, A. Padaki, A. Ullah, M. Sohul, T. Yang, J. H. Reed, "Practical Issues for Spectrum Management with Cognitive Radios," *Proceedings of the IEEE*, March 2014.
15. M. Lichtman, J. H. Reed, T. C. Clancy, M. Norton, "Vulnerability of LTE to Hostile Interference," *IEEE Global Conference on Signal and Information Processing*, Dec. 2013.
16. M. Lichtman, W. C. Headley, J. H. Reed, "Automatic Modulation Classification under IQ Imbalance using Supervised Learning," *IEEE Military Communications Conference (MILCOM)*, Nov. 2013.
17. T. C. Clancy, M. Norton, M. Lichtman, "Security Challenges with LTE-Advanced Systems and Military Spectrum," *IEEE Military Communications Conference (MILCOM)*, Nov. 2013.
18. M. La Pan, M. Lichtman, T. C. Clancy, R. W. McGwier, "Protecting Physical Layer Synchronization: Mitigating Attacks against OFDM Acquisition," *Global Wireless Summit 2013*, June 2013.

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## Awards and Achievements

- Invited by DARPA to attend *Wait, What? Future Technology Forum* and was one of eight "early-career scientists" selected to have lunch and engage in discussion with Secretary of Defense Ash Carter and DARPA Director Arati Prabhakar [\*<pic>\*](#).
- Recipient of the *AOC Capitol Club* Electronic Warfare Scholarship
- Research featured in an *MIT Technology Review* article
- "Origins of Innovation" *class project* won *XCaliber Award*
- Winner of the *WICAT* Board Meeting Student Poster Contest
- Recipient of the Intelligence Community Center for Academic Excellence (IC-CAE) Scholarship
- Recipient of the Virginia Tech College of Engineering Fellowship

## Co-Authored Grant Proposals

Organization/Company	Amount	Solicitation	Title of Proposal
Air Force Research Lab.	\$76,000	BAA-RV-10-03	Robust Satellite Communications under Hostile Interference (Phase I)
Air Force Research Lab.	\$78,000	FOA-RVKV-2013-0001	Robust Satellite Communications under Hostile Interference (Phase II)
QinetiQ North America	\$100,000	N/A	Vulnerabilities of LTE to RF Interference and Spoofing
<b>Total</b>	<b>\$254,000</b>		

## Professional Memberships

2009 → **Student Member**, *Institute for Electrical and Electronics Engineers (IEEE)*.

2012 → **Student Member**, *IEEE Communications Society*.

2014 → **Student Member**, *IEEE Signal Processing Society*.

## Technical Reviewing

### Reviewer for:

- IEEE Communications Letters
- IEEE Systems Journal
- Proceedings of the IEEE
- IEEE/ACM Transactions on Networking
- IEEE Transactions on Mobile Computing
- IEEE DySPAN
- IEEE MILCOM