

Alon S. Levin

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RESEARCH INTERESTS

Full-duplex wireless, network resilience and robustness, compressed sensing, physical layer security, Internet of Things (IoT), machine learning.

EDUCATION

- 2021 – Present **Columbia University**, New York, NY
Ph.D. Candidate, Electrical Engineering
Advisor: Prof. Gil Zussman
- 2016 – 2021 **The Cooper Union**, New York, NY
M.Eng., 2021, Electrical Engineering, Integrated 4+ Joint Degree Program
B.Eng., 2020, Electrical Engineering, *magna cum laude*
Advisor: Prof. Fred L. Fontaine

AWARDS AND HONORS

- 2022 – Present National Defense Science and Engineering Graduate (NDSEG) Fellowship
- 2022 Columbia Engineering Byron Fellowship
- 2020 Radio Club of America Scholarship Award
Barone-DeBlasi-Facella Fund
- 2018 – 2021 IEEE Eta Kappa Nu
Delta Chi Chapter Vice President
- 2018 – 2021 Tau Beta Pi
New York Iota Chapter Corresponding Secretary
- 2018 Peter Cooper Startup Challenge – First Place
- 2017 Quadruple Impact Challenge Finalist
Publicly Voted Best Submission
- 2017 Invention Factory Best Invention Award – Second Prize
- 2016 – 2020 Cooper Union Dean’s List
- 2016 – 2020 Cooper Union Innovator Merit Scholarship

EXPERIENCE

- 2021 – Present **Columbia University**, New York, NY
Graduate Research Assistant, Wireless & Mobile Networking (WiMNet) Lab
- Develop and evaluate the performance of self-interference cancellation algorithms for Gen-3 full-duplex radios, with the goal of embedding algorithms in dedicated hardware to enable real-time adaptive equalization of the self-interference channel.
 - Integrate Gen-3 canceller integrated circuits with software-defined radio transceivers to realize full-duplex wireless links.
 - This work is within the **Full-Duplex** Wireless: From **Integrated Circuits to Networks (FlexICoN)** project and is in collaboration with Prof. Harish Krishnaswamy's and Prof. Mingoo Seok's groups.
- Sum. 2020 **ExxonMobil Research & Engineering**, Spring, TX
Security & Controls Intern, Automation, Process & Controls Division
- Established a centralized logging system to aggregate security logs, antivirus activity, and critical event data across all machines on processing plants' L3 computer network.
 - Automated cybersecurity analysis techniques to increase the efficiency of security event investigation processes.
 - Developed forensic monitoring and reporting protocols for industrial control systems.
- Sum. 2019 **New York Institute of Technology**, New York, NY
NSF REU Fellow, Security of Mobile Devices and Wireless Networks
Mentor: Asst. Prof. Anand Santhanakrishnan
- Designed a statistical model for inter-user relationships in the context of heterogeneous networks to investigate the impact of net neutrality on the churning rates of internet service providers.
 - Simulated a 20-user, 20-ISP heterogeneous network both in the presence of and absence of net neutrality.
- Win. 2018 **E-J Electric Installation Co.**, Queens, NY
Project Management Intern, Transit Division
- Surveyed wireless smart meter installation sites and sketched design propositions.
 - Created and edited CAD drawings of design propositions based on surveys and design requirements.
 - Established and maintained database of relevant survey photographs, CAD drawings, and financial documents.

PUBLICATIONS

Thesis

- Th1 **A. S. Levin**, "Hierarchical Semantic Segmentation of Histopathological Whole Slide Images by Means of Sparse Dictionary Learning," M.Eng. thesis, E.E. Dept., The Cooper Union for the Advancement of Science and Art, New York, 2021. Available: [ProQuest Dissertations Publishing](#)

DEMOS AND PRESENTATIONS

- DP8 **A. S. Levin**, I. Kadota, S. Garikapati, B. Zhang, A. Jolly, M. Kohli, M. Seok, H. Krishnaswamy, and G. Zussman, "Demo: Experimentation with Wideband Real-Time

Adaptive Full Duplex Radios,” *ACM SIGCOMM’23*, New York, NY, Sept. 2023.
[Accepted for publication]

- DP7 **A. S. Levin**, I. Kadota, A. Jolly, S. Garikapati, B. Zhang, M. Kohli, M. Seok, H. Krishnaswamy, and G. Zussman, “Towards a Real-Time Adaptive Full-Duplex Wireless Radio,” presented at *Columbia Data Science Day*, Columbia University, New York, NY, Apr. 2023.
- DP6 I. Kadota*, **A. S. Levin***, B. Zhang*, S. Garikapati, A. Jolly, M. Kohli, T. Chen, M. Seok, H. Krishnaswamy, and G. Zussman, “Adaptive Configuration of a Variable-Gain, Variable-Delay Self-Interference Canceller for a Full-Duplex System,” *DARPA MTO WARP End of Phase Review*, Fort Worth, TX, Jun. 2022.
* indicate equal contributions
- DP5 **A. S. Levin**, I. Kadota, S. Garikapati, H. Krishnaswamy, and G. Zussman, “Adaptive Configuration of a Variable-Gain, Variable-Delay Self-Interference Canceller for Full-Duplex Wireless,” presented at *Columbia Data Science Day*, Columbia University, New York, NY, Apr. 2022.
- DP4 **A. S. Levin**, “Hierarchical Semantic Segmentation of Histopathological Whole Slide Images by Means of Sparse Dictionary Learning,” *M.Eng. Thesis Defense, The Cooper Union*, New York, NY, Sept. 2021.
- DP3 **A. S. Levin**, B. Kaplan, and C. Goldfarb, “A Near Real-Time Algorithm for Drosophilidae Neural Compass Analysis,” *Capstone Project Presentations, The Cooper Union*, New York, NY, May 2020.
- DP2 **A. S. Levin**, “Impact of Net Neutrality Repeal in the Presence of Malicious Users in HetNets,” *NSF REU Fellowship Presentations, New York Institute of Technology*, New York, NY, Aug. 2019.
- DP1 **A. S. Levin** and B. Kaplan, “EpiWear: A Novel Wearable Epinephrine Injector,” *MedTech Impact Conference and Expo*, Las Vegas, NV, Dec. 2017.
Invited talk, Quadruple Impact Challenge Finalist

TEACHING

Head Teaching Assistant, Columbia University, New York, NY

Spring 2023 Computer Networks

Teaching Assistant, Columbia University, New York, NY

Spring 2022 Computer Networks

Fall 2021 Introduction to Electrical Engineering

Fall 2021 Digital Information Age

Teaching Assistant, The Cooper Union, New York, NY

Sum. 2018 Digital Logic Design (Summer STEM)

MENTORING

M.S. Students

2023 Eliot Samuel Flores Portillo, Columbia University

2022 Aditya Jolly, Columbia University, currently at Qualcomm
Thesis: *Real-Time Adaptive Wideband Full Duplex Radios: Integration and Optimization*

Undergraduate Students

Sum. 2023 Ahuva Bechhofer, Columbia University
Anya Trumbach, Columbia University

Sum. 2022 Samuel Cohen, Yeshiva University

High School Students

Sum. 2023 Enzo Schulze, Townsend Harris High School

PROFESSIONAL SERVICE

Committee Appointments

2023 Industry Liaison (Student Leadership Council), [NSF ERC Center for Smart Streetscapes](#)

Outreach & Education

2023 COSMOS Testbed Tour, *Hamilton Grange Middle School* ([media](#))
Wireless Principles Demo, *The School at Columbia STEAM Expo* ([media](#))

2022 COSMOS Education Toolkit Demo, *Columbia Secondary School* ([media](#))
Guest Evaluator, *Cooper Union Invention Factory*
Panelist, *NYIT REU: Ph.D. Q&A*
Panelist, *Columbia Secondary School Career Day*
Panelist, *Working in Columbia Labs: Tips, Tricks, & Insights*
COSMOS Education Toolkit Demo, *Silicon Harlem Center Grand Opening* ([media](#))

CERTIFICATIONS

Engineer-In-Training Certification (Electrical and Computer)
New York State, January 2022

Updated July 2023