JOSHUA COLE SCHUETTA
Independent Researcher (Electrical Engineering)
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EDUCATION

Master of Science in Electrical Engineering (M.S.E.E.)
Arizona State University, Ira A. Fulton Schools of Engineering
Concentration: Photonics, Optoelectronics, Signal Processing, Applied Electromagnetics

Bachelor of Science in Electrical Engineering (B.S.E.E.), Barrett, The Honors College
Arizona State University, Ira A. Fulton Schools of Engineering
Honors Thesis: *AUAV PEOM-RFS: Development of a Pulsed Electro-Optical Modulated RF Spectrometer for Autonomous Platforms*

RESEARCH INTERESTS

- Performance collapse and failure boundaries in engineered systems under stress, degradation, and uncertainty
- Robustness evaluation under controlled degradation and measurement-constrained testing
- Photonic RF sensing and spectrometry; signal integrity limits and sensitivity regimes
- Measurement-theoretic limits in adaptive systems and real-time decision pipelines
- Collapse-aware control, stability, and operational envelope characterization

PUBLICATIONS AND PREPRINTS

- **Joshua Cole Schuetta**, *Characterizing Performance Collapse in MFCC–Neural ASR Pipelines Under Controlled Acoustic Degradation*, arXiv preprint, 2026.
- **Joshua Cole Schuetta**, *Generalization of Performance Collapse Across Neural Representation Classes*, arXiv preprint, 2026.
- **Joshua Cole Schuetta**, *Abrupt Failure Boundaries in Photonic RF Sensing Systems Under Noise and Sensitivity Constraints*, arXiv preprint, 2026.
- **Joshua Cole Schuetta**, *Collapse-Informed Evaluation of Adaptive Control Stability in Degraded Signal Environments*, arXiv preprint, 2026.

SELECTED TECHNICAL CONTRIBUTIONS

- Developed controlled degradation evaluation frameworks to identify abrupt failure boundaries in neural signal-processing pipelines
- Introduced quantitative collapse metrics based on local slope/curvature and representation instability indicators

- Implemented end-to-end analysis pipelines for sweep-based robustness characterization and reproducible reporting
- Built physics-grounded modeling workflows for sensing performance under operational constraints (noise, bandwidth, and detectability regimes)
- Applied measurement-first methodology to connect observable signal deformation to downstream system reliability

PROFESSIONAL MEMBERSHIPS & HONORS

- Institute of Electrical and Electronics Engineers (IEEE)
- IEEE Signal Processing Society
- IEEE Photonics Society
- IEEE Microwave Theory and Techniques Society (MTT-S)
- IEEE Aerospace & Electronic Systems Society (AESS)
- IEEE-Eta Kappa Nu (IEEE-HKN), Epsilon Beta Chapter

TOOLS

- Python (scientific computing, analysis automation), MATLAB (signal processing and modeling), LaTeX (technical writing)

SERVICE

- Reviewer for IEEE conferences and journals

Additional Technical Training

- Mathematical Concepts of Engineering, Ira A. Fulton Schools of Engineering, Arizona State University
- Renewable Energy Technology and Systems, Ira A. Fulton Schools of Engineering, Arizona State University
- Technology Leadership and Innovation, Massachusetts Institute of Technology