

Shizhen Jia



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OBJECTIVE

Ph.D. candidate in wireless communications at NYU WIRELESS seeking internship opportunities in wireless systems and signal processing. Experienced in MIMO beamforming, interference mitigation, ray tracing, game-theoretic optimization, and large-scale simulation, with strong interests in theoretical modeling, practical applications, FR3 spectrum studies, and scalable communication systems for next-generation terrestrial and non-terrestrial networks.

EDUCATION

• New York University	Sep. 2024-Present
<i>Ph.D. candidate in Electrical Engineering, Advisor: Sundeep Rangan</i>	New York
• New York University	Sep. 2022-Aug. 2024
<i>M.S. in Electrical Engineering</i>	New York
• Chongqing University	Sep. 2018-Jun. 2022
<i>B.Eng. in Electrical Engineering</i>	China

RESEARCH PROJECTS

- **Terrestrial–Satellite Downlink Co-Existence via Joint Detection, Channel Estimation, and Interference Nulling** Sep. 2024-Present
Advisor: Sundeep Rangan, Tools: Python, Sionna-RT
 - 4-stage coexistence protocol: uplink broadcast, victim detection, channel estimation, downlink nulling.
 - Regularized null-steering beamformer via principal-eigenvector solution (gain-null trade-off).
 - Site-specific rural macrocell evaluation with ray tracing; quantified overhead and INR/SNR trade-offs.
 - Large INR reduction vs. no-nulling baseline; improved protection with Massive MIMO.
- **Distributed Uplink Anti-Jamming in LEO Mega-Constellations** May. 2025-Present
Advisor: Sundeep Rangan, Tools: Python, Sionna-RT
 - Formulated uplink anti-jamming as a min–max game over transmit covariance matrices (TX vs. jammer).
 - Developed a fast solver: alternating water-filling best response (TX) + projected gradient updates (jammer) to a Nash equilibrium.
 - Built a Starlink-geometry case study with Sionna ray tracing and realistic interference/jammer models.
 - Showed multi-satellite cooperation (3–5 sats) improves capacity vs. single-satellite links under close-proximity dish and intelligent-array jamming.
- **OTA Phase Measurements: Multipath Impact & Narrowband Array Calibration** Aug. 2025-Present
Advisor: Sundeep Rangan, Collaborator: Andrea Bedin, Tools: Pi-Radio Marie Curie, RFSoC, Matlab, Python
 - Showed multipath phase error is often small, even with bandwidths of only a few MHz.
 - Developed a one-shot statistical model linking multipath amplitude to phase-error behavior.
 - Proved multipath-induced phase error is zero-mean, enabling spatial averaging via antenna movement.
 - Quantified spatial correlation using inter-/intra-measurement std vs. displacement and convergence.
 - Proposed a low-complexity OTA narrowband array-calibration strategy based on movement + averaging.
- **Interference Avoidance for FMCW Automotive Radars via Non-Cooperative Game** Aug. 2023 - Aug. 2024
M.S. Thesis, Advisor: Quanyan Zhu, Tools: Matlab
 - Developed a system-level interference framework for FMCW automotive radar networks.
 - Established an analytical collision model linking waveform timing to SINR degradation.
 - Formulated spectrum coordination as a non-cooperative game and derived mixed-strategy equilibria.
 - Quantified robustness gains of game-theoretic policies over heuristic baselines via simulation.

PUBLICATIONS

- [C.1] Shizhen Jia, Mingjun Ying, Marco Mezzavilla, Doru Calin, Theodore S. Rappaport, Sundeep Rangan (2025). **Joint Detection, Channel Estimation and Interference Nulling for Terrestrial–Satellite Downlink Co-Existence in the Upper Mid-Band**. *Proceedings of the IEEE Global Communications Conference (GLOBECOM)*, accepted, December 2025.
- [C.2] Shizhen Jia, Mingjun Ying, Marco Mezzavilla, Theodore S. Rappaport, Sundeep Rangan (2026). **Distributed Uplink Anti-Jamming in LEO Mega-Constellations via Game-Theoretic Beamforming**. *Proceedings of the IEEE International Conference on Communications (ICC)*, accepted, 2026.

PROFESSIONAL ACTIVITIES

- **Conference Reviewer**
 - IEEE Global Communications Conference (GLOBECOM)
 - IEEE International Conference on Communications (ICC)