Hesam Nezhadmohammad

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EDUCATION

Shahid Beheshti University (National University of Iran)   Tehran, Iran
M.Sc. in Telecommunications Engineering; GPA: 17.05/20 (3.42/4.0)   *Sep. 2021 – Sep. 2024*

- **Thesis:** *Using Reconfigurable Intelligent Surfaces (RISs) for Improvement of Indoor Wireless Communication Environment*
- **Thesis Grade:** *19.5/20 (A+)*
- **Supervisors:** *Dr. Reza Asvadi, Dr. Abbas Pirhadi*

Azad University, Karaj   Karaj, Iran
B.Sc. in Electrical Engineering; GPA: 15.23/20   *Sep. 2016 – Oct. 2020*

- **Thesis:** *Energy Management in Energy-Harvesting Wireless Communication Systems*
- **Thesis Grade:** *17/20 (A)*
- **Supervisor:** *Dr. Farzad Golshan*

EXPERTISE

- Focus: Reconfigurable intelligent surface, beyond-diagonal reconfigurable intelligent surface, mmWave communications
- Interest: Wireless communications, integrated sensing and communication, mmWave/THz communications, multi-antenna techniques (hybrid beamforming, interference alignment)
- Skills: Optimization (surrogate, fractional, geometric, dynamic, manifold, ADMM, pp-ADMM, SCA, SDR), machine learning, matrix analysis, tensor methods, system modeling, algorithms & simulations

PUBLICATIONS

1. H. Nezhadmohammad, M. Nerini, R. Asvadi, A. Pirhadi, and B. Clerckx, "Beyond-Diagonal RIS-Aided Outdoor-to-Indoor mmWave Communications," *to be submitted to IEEE Transactions on Wireless Communications*, 2025.

TEACHING EXPERIENCE

Shahid Beheshti University (National University of Iran)   Tehran, Iran
Teaching Assistant – Wireless Communications   *Fall 2024*
Instructor: Dr. Reza Asvadi

- Tutored graduate students and provided problem-solving assistance during tutorials.
- Answered students' questions and supported understanding of key wireless communication concepts.
- Graded assignments and exams, and assisted in preparing course projects and exercises.

ACADEMIC PROJECTS

- **Sudoku Puzzle Solver via Convex Optimization** [code]
  Course: Convex Optimization — Instructor: Prof. Esfandiar Mehrshahi
  Formulated Sudoku as a 0-1 linear programming problem with row, column, box, and clue constraints in a sparse linear system, then solved the resulting convex feasibility problem in MATLAB using CVX with the MOSEK solver to recover valid Sudoku grids.

- **Two-Stage BD-RIS Beamforming Design Without a Direct BS-User Link** [code, report]
  Extended the two-stage BD-RIS beamforming framework to the case where the direct BS-user path is not available, reformulating the objective with the cascaded BS-RIS-user channel. Derived the correct gradient and descent direction at a feasible symmetric-unitary point and applied symmetric-unitary projection to obtain scattering matrices for fully and group-connected architectures.

Selected Courses

Wireless Communications (A+ 4.0/4.0); Channel Coding (A+ 4.0/4.0); Convex Optimization (A 4.0/4.0)

Technical Skills

Programming Languages: MATLAB, Python, HTML, CSS, Lua, C++
Frameworks: CVX, Manopt, NumPy, Pandas, PyTorch
Tools: MATLAB, Wireless InSite, Inkscape, Blender

Training

- Wireless Communication Course by Prof. Bruno Clerckx

- Convex Optimization Course by Prof. Bruno Clerckx

- A deep understanding of deep learning by Prof. Mike X Cohen (in progress)

References

- **Dr. Reza Asvadi**
  Department of Electrical Engineering, Shahid Beheshti University, Tehran, Iran [email]

- **Dr. Abbas Pirhadi**
  Department of Electrical Engineering, Shahid Beheshti University, Tehran, Iran [email]

- **Prof. Esfandiar Mehrshahi**
  Department of Electrical Engineering, Shahid Beheshti University, Tehran, Iran [email]