

# Hesam Nezhadmohammad

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## EDUCATION

### Shahid Beheshti University (National University of Iran)

M.Sc. in Telecommunications Engineering; GPA: 17.05/20 (3.42/4.0)

Tehran, Iran

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

B.Sc. in Electrical Engineering; GPA: 15.23/20

Karaj, Iran

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, backscatter 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,” *manuscript in preparation for submission to IEEE Transactions on Wireless Communications*.

## 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

### Graph Theoretic Visualization of BD-RIS Sparsity Patterns [code]

Developed a graph theoretic visualization framework that constructs the sparsity patterns of the BD-RIS susceptance matrix for different architectures (fully-connected, group-connected, single-connected, tridiagonal, arrowhead, band-connected, and stem-connected) and generates interpretable sparsity plots that aid in understanding, comparing, and designing low-complexity BD-RIS architectures.

### 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-connected and group-connected architectures.

- **Sudoku Puzzle Solver via Convex Optimization** [[code](#)]

Course: Convex Optimization (Spring 2023) — Instructor: Dr. 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.

## SELECTED COURSES

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

## TECHNICAL SKILLS

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**Programming Languages:** MATLAB, Python, C++, HTML, CSS, Lua

**Frameworks:** CVX, Manopt, NumPy, Pandas, PyTorch

**Tools:** MATLAB, Wireless InSite, Inkscape, Blender

## TRAINING

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- [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

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- **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](#)]
- **Dr. Esfandiar Mehrshahi**  
Department of Electrical Engineering, Shahid Beheshti University, Tehran, Iran [[email](#)]