Nam Nguyen

Ph.D. Student in Electrical and Computer Engineering

nguynam4@oregonstate.edu linkedin.com/in/nam-nguyen-osu +1 (458) 272-7520

EDUCATION

Oregon State University Corvallis, OR, US
Ph.D. in Electrical and Computer Engineering Expected Mar. 2027
Focus area: Information Theory, Machine Learning, Wireless Communications

Oregon State University Corvallis, OR, US
M.S. in Electrical and Computer Engineering, GPA: 3.83/4.00 Jun. 2024
Thesis: *On Symbol Error Probability-based Beamforming in MIMO Gaussian Wiretap Channels*

Posts and Telecommunications Institute of Technology Hanoi, Vietnam
B.Eng. in Electronics and Communications Engineering Mar. 2021
Graduated in top 10 of Telecommunications Engineering Department
Thesis: *Performance Enhancement of Satellite-based Free-Space Quantum Key Distribution Systems using Key Retransmission and Relaying Techniques*, Grade: 10/10

TECHNICAL SKILLS

Quantitative Research: Mathematical Modeling, Optimization, Statistics and Probability Theory.

Programming Skills: MATLAB, Python, C/C++, LaTeX.

Software Tools: Pytorch, Pandas, NumPy, MATLAB Toolboxes, Simulink, CVX.

Familiar Topics: Machine learning, wireless communication, digital signal processing, DSP embedded coding, OFDM, information theory, coding theory, MIMO communications, satellite-based quantum key distribution systems, free-space optical communications, optimization algorithms, applied mathematics.

Research Experience: Leading projects, problem-solving, programming, simulations, presenting findings, and academic writing.

RESEARCH EXPERIENCE

Research Assistant, Communications and Signal Processing Group Dec. 2022 - Present
Oregon State University Corvallis, OR, US
Project: *Design and Security Analysis of Symbol Error Probability-based Beamforming in MIMO Gaussian Wiretap Channels*

- Leading researcher and first author of **01** paper on low-complexity, high-performance symbol error probability minimization-based beamforming in Gaussian MIMO Wiretap Channels.
- Defined the research problem by identifying knowledge gaps in existing beamforming work.
- Formulated a mathematical model and proposed a novel low-complexity algorithm utilizing KKT conditions, generalized eigen-decomposition, and projected gradient descent.
- Conducted numerical experiments in MATLAB to evaluate the proposed beamforming scheme, analyzed results, and authored the paper.

Research Assistant, Optical Communications Research Group Mar. 2019 - Mar. 2023
Posts and Telecommunications Institute of Technology Hanoi, Vietnam
Project: *Design and Security Analysis of Satellite-based Free-Space Quantum Key Distribution Systems for Wireless and Vehicular Networks*
Sponsor: National Foundation for Science and Technology Development (NAFOSTED, Vietnam)

- Lead researcher and first author of **04** papers on satellite-based free-space quantum key distribution (QKD) systems for wireless networks.
- Innovated project ideas by expanding terrestrial binary phase shift keying (BPSK) modulation/direct-detection/QKD systems to satellite-based quadrature phase shift keying (QPSK) modulation/QKD systems.
- Designed and analyzed satellite-based QKD systems, including link-layer retransmissions, relaying techniques, and performance evaluations under atmospheric turbulence-induced phase fluctuations.
- Executed numerical experiments in MATLAB to assess system performance, analyzed results, and authored research papers.

INDUSTRY EXPERIENCE

Mobifone Telecommunications Corporation Sept. 2020 - Dec. 2020
Networking and Communication Engineer Intern Hanoi, Vietnam

- Conducted an in-depth study of technical documents to gain expertise in the 4G/LTE protocol and its applications in the telecommunications industry.
- Investigated and analyzed system and network operations, gaining valuable insights into network management and monitoring systems.

Viettel High Technology Industries Corporation Jun. 2019 - Sept. 2019
Research and Development Intern Hanoi, Vietnam

- Completed a competitive summer course on 4G/LTE Protocol Development, awarded a certificate for the top-performing project.
- Developed a multi-client TCP user client-server system to handle login, score retrieval, and logout requests over multi-threaded processes:
  - Designed a TCP server to authenticate clients and respond with scores, using unique threads for each client to handle simultaneous requests.
  - Utilized C, TCP/UDP libraries, and Linux, implementing functional programming for modularity and enhanced efficiency.
- **Tools/Technologies:** C, TCP/UDP Library, Linux, Functional Programming.

FPT Software Company Oct. 2019 - Dec. 2019
Linux Embedded Challenge Participant Hanoi, Vietnam

- Awarded First Prize for "Top Outstanding Achievement in Linux Embedded Challenge" by developing embedded C code to control a drone's movement, including flying up, navigating, and turning.
- **Tools/Technologies:** C Embedded Coding, Linux, Functional Programming.

TEACHING EXPERIENCE

Teaching Assistant, Electrical Engineering and Computer Science Mar. 2022 - Present
Oregon State University Corvallis, OR, US

- **Courses:** ECE 353 - Introduction To Probability and Random Signals (3 quarters), ECE 351 - Signals and Systems I (2 quarters), ECE 352 - Signals and Systems II (1 quarter), CS 372 - Introduction to Computer Networks (1 quarter), ENGR 201 - Electrical Fundamentals I (4 quarters), ECE 271 - Digital Logic Design (1 quarter).
- **Responsibilities:** Grading assignments and exams, holding office hours and review sessions, and improving course materials.

SELECTED PUBLICATIONS

[1] **Nam Nguyen**, An Vuong, Thuan Nguyen, and Thinh Nguyen. *On Minimizing Symbol Error Probability for Antipodal Beamforming in Gaussian MIMO Wiretap Channels.* 2024 IEEE Vehicular Technology Conference, Washington, D.C., US, Oct. 2024.

[2] **Nam Nguyen**, Thang V. Nguyen, Ngoc T. Dang, and Vuong Mai. *Performance of Satellite Quantum Key Distribution under Atmospheric Turbulence-Induced Phase Fluctuations.* International Communications Satellite Systems Conference, Bradford, UK, Oct. 2023.

[3] **Nam D. Nguyen**, Hang T. T. Phan, Hien T. T. Pham, Vuong V. Mai, and Ngoc T. Dang. *Reliability Improvement of Satellite-based Quantum Key Distribution Systems using Retransmission Scheme.* Photonic Network Communications, 42, 27–39, 2021.

AWARDS

Graduate School's Scholarly Presentation Award – Oregon State University 2024

SVTECH Scholarship – SV Technologies JSC 2021
Awarded to 5 outstanding students at the Posts and Telecommunications Institute of Technology.

Second Prize, National Scientific Research Contest – Vietnam Ministry of Education and Training 2020

First Prize, Scientific Research Contest – Posts and Telecommunications Institute of Technology 2019