

# Nghi H. Tran

---

CONTACT INFORMATION Department of Electrical & Computer Engineering Phone: 1-330-812-4756  
Auburn Science & Engineering Center, Room 352 E-mail: nghi.tran@uakron.edu  
The University of Akron https://blogs.uakron.edu/tran/  
Akron, OH, 44325-3905

## APPOINTMENTS

- 08/2017-Present Associate Professor (with tenure), Department of Electrical & Computer Engineering, University of Akron, Akron, OH USA
- 08/2011-07/2017 Assistant Professor, Department of Electrical & Computer Engineering, University of Akron, Akron, OH USA
- 05/2008-07/2011 NSERC Postdoctoral Scholar, McGill University, Montreal, QC Canada
- 07/2010-10/2010 Systems Engineer, Advantech Satellite Networks, Montreal, QC Canada
- 09/2007-04/2008 Research Associate, McGill University, Montreal, QC Canada

RESEARCH INTERESTS Energy-efficient wireless networks, cognitive radio (CR) and security issues in CR networks, physical-layer security and cross-layer security, spectrum coexistence, full-duplex radio, deep learning in physical layer communications, massive MIMO, error control coding and iterative decoding, SATCOM resiliency, GNSS (current Google scholar h-index: 24).

## EDUCATION

**University of Saskatchewan**, Saskatoon, SK, Canada

Ph.D., Department of Electrical & Computer Engineering, May 2008

- Dissertation: “Exploiting Diversity in Wireless Channels with Bit-Interleaved Coded Modulation and Iterative Decoding (BICM-ID)”  
With this dissertation, I was nominated for the Natural Sciences and Engineering Research Council of Canada (NSERC) Doctoral Prize
- Advisors: Prof. Ha H. Nguyen and Prof. Tho Le-Ngoc (McGill University)

**University of Saskatchewan**, Saskatoon, SK, Canada

M.Sc., Department of Electrical & Computer Engineering, December 2004

- Thesis: “Signal Mapping Designs for BICM-ID”
- Advisor: Prof. Ha H. Nguyen  
This thesis was awarded the **University of Saskatchewan Graduate Thesis Award in the Physical and Engineering Sciences**.

**Hanoi University of Technology**, Hanoi, Vietnam

B.Sc., Department of Electrical Engineering, June 2002

## SCHOLARLY AND PROFESSIONAL ACTIVITIES

### Journal Editorial Board

- Senior Editor, IEEE Communications Letters (09/2019-Present)
- Editor, IEEE Transactions on Vehicular Technology (09/2021-Present)
- Editor, Elsevier Physical Communication (10/2015-12/2021)
- Editor, IEEE Transactions on Communications (02/2016-07/2021)
- Editor, IEEE Communications Letters (02/2016-08/2019)

### Guest Journal Editor

- Lead Guest Editor, IEEE Open Journal of the Communications Society (OJ-COMS), Special Issue on “*Full-Duplex Communications*” (2021)

- Lead Guest Editor, Elsevier PHYCOM, Special Issue on “*Heterogeneous Vehicular Networks: Physical Layer Technologies and Designs*” (2018)
- Lead Guest Editor, EURASIP Journal on Wireless Communications and Networking, Special Issue on “*Full-Duplex Radio: Theory, Design, and Applications*” (2016)

#### **Committee Chair**

- Publicity Chair, IEEE ICC 2020, Sixth Workshop on Full-Duplex Communications for Future Wireless Networks
- Tutorial Chair, International Conference on Telecommunications (ICT) 2019
- Publicity Chair, IEEE ICC 2019, Fifth Workshop on Full-Duplex Communications for Future Wireless Networks
- Publicity Chair, IEEE Globecom 2018, Forth Workshop on Full-Duplex Communications for Future Wireless Networks
- Publicity Chair, IEEE ICC 2018, Third Workshop on Full-Duplex Communications for Future Wireless Networks
- Publicity Chair, IEEE Globecom 2017, Second Workshop on Full-Duplex Communications for Future Wireless Networks
- Publicity Chair, IEEE ICC 2017 Workshop on Full-Duplex Communications for Future Wireless Networks
- TPC Co-Chair, IEEE Globecom 2014 Workshop on Trusted Communications with Physical Layer Security

#### **Selected Technical Programming Committee Member**

- IEEE Communication Theory Technical Committee
- IEEE Communications and Information Security Technical Committee
- IEEE Signal Processing and Communications Electronics Technical Committee
- IEEE Globecom, IEEE ICC
- IEEE VTC Spring and Fall

#### UNIVERSITY AND DEPARTMENTAL SERVICES

- Search Committee for two EE Assistant Professor positions (2022-2023)
- Search Committee for a CpE Assistant Professor position (2021-2022)
- Assessment and Accreditation (A&A) Coordinator - Computer Engineering (2016-Present)
- Undergraduate Curriculum Committee (2016-Present)
- Students’ Advising Committee (2014-Present)
- Committee for Non-Curricular Activities (2014 and 2015)
- Merit Raise Committee (2012-2013)
- Search Committee for three Assistant Professor positions (2012-2013)

#### HONORS AND AWARDS

- IEEE Communications Letters, Exemplary Editor, December 2022
- Best Paper Award of the IEEE SigTelCom, April 2022
- Best Paper Award of IEEE International Conference on Consumer Electronics – Taiwan, May 2019

IEEE Communications Letters Editor Award, December 2017

Best Student Paper Award of the IEEE SigTelCom, Da Nang, Vietnam, January 2017

Best Student Paper Award of the IEEE ICCE, Ha Long, Vietnam, July 2016

Best Paper Award of the IEEE ComManTel, Da Nang, Vietnam, December 2015

Best Paper Award Runner-up of the IEEE Canadian Workshop on Information Theory (CWIT), St. John, NL, Canada, July 2015

IEEE Senior Member, since February 2015

NSERC Doctoral Prize Nomination, July 2008

NSERC Postdoctoral Fellowship, May 2008

University of Saskatchewan Graduate Thesis Award in the Physical and Engineering Sciences

## RESEARCH GRANTS

### Funded Projects

1. *FA9453-23-1-0002: Theoretical Limits and Coding for Ultra-Reliable, Low Latency, and Secure GNSS in Urban Fading Environments*, Air Force Research Lab (AFRL), **N. H. Tran; Total: \$140,000**; Akron's share: \$140,000; Performance period: 02/2023-05/2025.
2. *Interference-Aware Spectrum Utilization for Coexistence of Passive and Active Wireless Systems*, Faculty Research Grant, University of Akron, **N. H. Tran; Total: \$10,000**; Performance period: 05/2022-04/2023.
3. *REU Supplement: SaTC: CORE: Small: A Practical Approach to Study Security in Wireless Networks*, NSF-SaTC, **N. H. Tran; Total: \$16,000**; Performance period: 2022.
4. *Smart On-Board Satellite AGC Loop with Anti-Jamming Capability for Spread Spectrum Frequency Hopping System – Phase II*, Air Force Research Lab (AFRL) SBIR, **N. H. Tran** (in collaboration with Intelligent Fusion Technology); **Total: \$750,000**; Akron's share: \$50,000; Performance period: 07/2021-06/2023.
5. *SaTC: CORE: Small: A Practical Approach to Study Security in Wireless Networks*, NSF-Computer and Network Systems, H. Bahrami and **N. H. Tran; Total: \$500,000**; Akron's share: \$500,000; Performance period: 10/2020-09/2024.
6. *Measurement and Analysis of SATCOM Operational Resiliency - Phase III – Multiagent Reinforcement Learning Approaches*, **Linquest Corporation, N. H. Tran** (in collaboration with D. Nguyen from San Diego State University); **Total: \$50,000**; My share: \$15,000; Performance period: 10/2021-10/2022.
7. *Measurement and Analysis of SATCOM Operational Resiliency - Phase II – Deep Reinforcement Learning Approaches*, **Linquest Corporation, N. H. Tran** (in collaboration with D. Nguyen from San Diego State University); **Total: \$50,000**; My share: \$25,000; Performance period: 09/2020-07/2021.
8. *Measurement and Analysis of SATCOM Operational Resiliency - Phase I - Game Theoretical and Reinforcement Learning Approaches*, **Linquest Corporation, N. H. Tran** (in collaboration with D. Nguyen from San Diego State University); **Total: \$50,000**; My share: \$25,000; Performance period: 12/2019-08/2020.
9. *US Ignite: Collaborative Research: Cloud Computing and Software-Defined Networking Enhancements to Support Collaborative, Problem-based STEM Education*, NSF-Computer and Network Systems, S. Sastry and **N. H. Tran** (in collaboration with A. Gokhale and G. Biswas from Vanderbilt University); **Total: \$600,000**; Akron's share: \$239,862; Performance period: 10/2015-09/2019.
10. *Collaborative Research: Full-Duplex Cognitive Radio: Theory and Hardware*, NSF-Electrical, Communications and Cyber Systems, **N. H. Tran** (in collaboration with T. Karacolak

from Washington State University Vancouver); **Total: \$359,765**; Akron's share: \$200,396; Performance period: 07/2015-06/2019.

11. *BAA-15-002: Embedded Systems Security*, Office of Naval Research (ONR), **N. H. Tran** and A. Madanayake (in collaboration with S. Shetty and C. Fan from Tennessee State University); **Total: \$600,000**; Akron's share: \$360,000; Performance period: 10/2015-09/2018.
12. *REU Supplement: Collaborative Research: Full-Duplex Cognitive Radio: Theory and Hardware*, NSF-Electrical, Communications and Cyber Systems, **N. H. Tran**; **Total: \$8,000**; Performance period: 2016.
13. *Communication Systems Under Impulsive Interference: Theory and Design*, Faculty Research Grant, University of Akron, **N. H. Tran**; **Total: \$10,000**; Performance period: 2014-2015.
14. *Information-theoretic and Physical-layer Security Treatments for Wireless Relay Networks*, Firestone Research, University of Akron, **N. H. Tran**; **Total: \$10,000**; Performance period: 2013-2014.
15. *Start-up Funds*, University of Akron **N. H. Tran**; **Total: \$450,000**.

## RESEARCH TRAINING

### Current Ph.D. Students

- Nuwan Kankanamge
- Sajjad Emdadi
- Iman Pourmohammadi
- Mehdi Hosseinali Zadeh
- Tarig Hyder

### Current M.Sc. Students

- Fahmid Mahmud

### Former Ph.D. Students

- Bach Tran (University of Akron - Co-supervised with Prof. Sastry) - Ph.D., December 2022 - *Framework for Artificial Intelligence Assisted Augmented Reality Systems for Education and Training*
- Md. Hasan Rahman (University of Akron) - Ph.D., January 2022 - *Signal Design and Capacity Limits of Heterogeneous Networks with Ultra-Low Resolution Analog-to-Digital Converters Under Gaussian Mixture Interference*
- Mohammad Ranjbar (University of Akron) - Ph.D., July 2019 (with **Outstanding ECE Thesis Award**) - *Optimal Signaling Strategies and Fundamental Limits of Next-Generation Energy-Efficient Wireless Networks*
- Duc-Anh Le (University of Akron) - Ph.D., August 2016 - *Fudamental Limits of Communications Channels under Non-Gaussian Interference*
- Leonardo Rodriguez (McGill University - Co-supervised with Prof. Le-Ngoc) - Ph.D., August 2014 - *Half- and Full-Duplex Amplify-and-Forward Single-Relay Systems: Achievable Rates, Power Allocations and Code Designs*

### Former M.Sc. Students

- Sejuti Banik (University of Akron) - M.Sc., July 2022 - *Signaling Schemes and Fundamental Limits of a 2-user Static Gaussian Multiple-Access Channel with 1-bit Analog-to-Digital Converter*
- Ying Wang (University of Akron) - M.Sc., May 2020 - *Low-resolution ADCs*
- Suresh Madishetty (University of Akron - Co-supervised with Dr. Madanayake) - M.Sc., December 2018 - *Design of Multi-Beam Hybrid Digital Beamforming Receivers*

- Minh Vu (University of Akron) - M.Sc., August 2018 - *Optimal Signalling Schemes and Capacities of Non-Coherent Correlated MISO Channels under Per-Antenna Power Constraints*
- Hasitha Bothenna (University of Akron - Co-supervised with Dr. Nguyen) - M.Sc., May 2018 - *Approximation of Information Rates in Non-Coherent MISO Wireless Channels with Finite Input Signals*
- Mohamed Elamin (University of Akron - Co-supervised with Prof. Sastry) - M.Sc., December 2017 - *Performance Analysis of SDN Concepts in Wireless Sensor Networks*
- Geethika Wijeratne (University of Akron) - M.Sc., August 2017 - *Fundamental Limits of Non-Coherent Rician Fading Channels with 1-Bit Output Quantization*
- Sravan Pulipati (University of Akron - Co-supervised with Dr. Madanayake) - M.Sc., August 2017 - *Electronically-Scanned Wideband Digital Aperture Antenna Arrays using Multi-Dimensional Space-Time Circuit-Network Resonance*
- Lubna Elsaid (University of Akron) - M.Sc., June 2016 - *Physical-Layer Security with Full-Duplex Decode-and-Forward Relaying: Secrecy Rates and Power Allocation*
- Cuong Dang (University of Akron) - M.Sc., December 2015 (with **Outstanding ECE Thesis Award**) - *Optimal Power Allocation and Secrecy Capacity of the Full-Duplex Amplify-and-Forward Wire-Tap Relay Channel under Residual Self-Interference*
- Rajika Kumarasiri (University of Toledo - Co-supervised with Prof. Vijay Devabhaktuni) - M.Sc., November 2014 - *Development of Novel Algorithms for Localization in Wireless Sensor Networks*
- Hung Vu (University of Akron) - M.Sc., June 2014 (with **Research Assistant of the Year Award**) - *Capacities of Bernoulli-Gaussian Impulsive Noise Channels in Rayleigh Fading*
- Tamseel M. Syed (University of Akron) - M.Sc., January 2014 - *Precoder Design Based on Mutual Information for Non-orthogonal Amplify and Forward Wireless Relay Networks*
- Tuyen Tran (University of Akron) - M.Sc., August 2013 (with **the prestigious Dean's Summer Fellowship**) - *Achievable Rate and Capacity of Amplify-and-Forward Multi-Relay Networks with Channel State Information*
- Leonardo Rodriguez (McGill University - Co-supervised with Prof. Le-Ngoc) - M.Sc., August 2010 - *Bit-interleaved coded modulation with iterative decoding (BICM-ID) using signal space diversity (SSD) over non-orthogonal amplify-and-forward (NAF) relay channels*

#### Ph.D. Thesis Committee Member

- Musaab Saeed (Dr. Bahrami, University of Akron) - Ph.D., 2022
- Xufeng Guo (Dr. Dong, University of Akron) - Ph.D., 2022
- Mohammad Noor Bin Shaheed (Prof. Sozer) - Ph.D., December 2021 - *Resilient Adaptive Control of Standalone DC Microgrids*
- Ti Nguyen (Prof. Long Le, INRS-EMT, Canada) - Ph.D., May 2020 - *Resource Management for Enabling Heterogeneous Services and Applications in Wireless Cellular Systems*
- Hassan Navazi (Prof. Jahangir Hossain, University of British Columbia, Canada) - Ph.D., May 2018 - *Multi-Dimensional Mapping of Higher Order Modulations for BICM-ID Over Rayleigh Fading Channels*
- Zhinchao Sheng (Prof. Hoang Duong Tuan, USTH, Australia) - Ph.D., May 2018 - *Optimal Signal Processing for Next-Generation Communication Systems*
- Adel Al Weshah (Prof. Hariraran, University of Akron) - Ph.D., July 2017 - *High Order On-Surface Radiation Boundary Conditions in Electromagnetic*
- Huu Minh Tam Ho (Prof. Hoang Duong Tuan, USTH, Australia) - Ph.D., January 2017 - *Interference Management in 5G Cellular Network*
- Mukesh Kumar Chippa (Prof. Sastry, University of Akron) - Ph.D., October 2016 - *Goal-Seeking Decision Support System to Empower Personal Wellness Management*

- Abdelrhman Mahamadi (Prof. Sastry, University of Akron) - Ph.D., August 2016 - *Bond Graphs Models for Human Behavior*
- Ardalan Alizadeh (Dr. Bahrami, University of Akron) - Ph.D., July 2016 - *Cognitive Communications in the Presence of Emerging Wireless Technologies*
- Mehdi Pirbazari (Dr. Bahrami, University of Akron) - Ph.D., May 2015 - *Space Modulation: Signal Design and Performance Evaluation*
- Nilanka Rajapaksha (Dr. Madanayake, University of Akron) - Ph.D., November 2014 - *Wave-digital Filter Based Circuits for Beamforming and RF-FPGAs*
- Mohammed Eltayeb (Dr. Bahrami, University of Akron) - Ph.D., Oct. 2014 - *Opportunistic Scheduling with Limited Feedback in Wireless Communications Networks*
- Chamith Wijenayake (Dr. Madanayake, University of Akron) - Ph.D., August 2014 - *Multi-dimensional Signal Processing And Circuits For Advanced Electronically Scanned Antenna Arrays*

#### **M.Sc. Thesis Committee Member**

- Andrew Cihon-Scott (Prof. Sozer, University of Akron) - M.Sc., 2023 (expected)
- Nick Seifert (Prof. Carletta, University of Akron) - M.Sc., 2022 (expected)
- John Vorhies (Dr. Lee, University of Akron) - M.Sc., May 2020 - *Low-complexity Algorithms for Light Field Image Processing*
- A N M Shahriyar Hossain (Prof. Tsukerman, University of Akron) - M.Sc., December 2019 - *Metamaterials: 3-D Homogenization and Dynamic Beam Steering*
- Srikar Reddy Naini (Dr. Lee, University of Akron) - M.Sc., May 2018 - *Ping-Pong Auto-Zero Amplifier with Rail-to-Rail Output Amplifier*
- Padmini Lala (Dr. Lee, University of Akron) - M.Sc., August 2017 - *An 8-bit 13.88 kS/s Extended Counting ADC*
- Minliang Liao (Dr. Bao, University of Akron) - M.Sc., April 2017 - *Analyzing and Predicting Helpfulness of Online Product Review*
- Gudipati Mounika Sravya Keerthana (Prof. Sastry, University of Akron) - M.Sc., January 2017 - *Application of Kalman Filter to Estimate Position of a Mobile Node in Indoor Environments*
- Sriharsha VanKamamidi (Prof. Sastry, University of Akron) - M.Sc., August 2016 - *Fusing Joint Information from Multiple Kinect Cameras to Detect Errors in Exercises*
- Siddhardha Mohan Sakhamuri (Dr. Toonen, University of Akron) - M.Sc., June 2016 - *Corrosion Sensor Based on Metallic Nanowire Arrays*
- Beruwawela Pathiranage Paboda Viduneth Ariyaratna (Dr. Madanayake, University of Akron) - M.Sc., May 2016 - *Scanned/Multi-Beam Aperture Array Processing using a Combined Analog IC and Digital Systems Approach*
- Nikitha Nelakonda (Dr. Hariharan, University of Akron) - M.Sc., February 2016 - *Design of Robust Superdirective Receiving Antenna Array for Circular, Hexagonal and Elliptical Geometries*
- Prasad Priyadarshana Fernando Boosabaduge (Dr. Sastry, University of Akron) - M.Sc., February 2016 - *Hybrid Recommender System Architecture for Personalized Wellness Management*
- Sai Prakash Reddy Gaddam (Dr. Sastry, University of Akron) - M.Sc., January 2016 - *An Approach to Estimating Caloric Expenditure During Exercise Activity Using Non-Invasive Kinect Camera*
- Viduneth Ariyaratna (Dr. Madanayake, University of Akron) - M.Sc., December 2015 - *Scanned/Multi-Beam Aperture Array Processing using a Combined Analog IC and Digital Systems Approach*
- Venkata Raja Satya Teja Nagavalli (Dr. Lee, University of Akron) - M.Sc., November 2015 - *Smart Discrete Water Quality Sensor*

- Abdelrhman Mahamadi (Dr. Sastry, University of Akron) - M.Sc., November 2014
- Dharma Teja Akkineni (Dr. Hariharan, University of Akron) - M.Sc., November 2014 - *A Fourier Spectral Method to Solve Linear and Non-Linear Differential Equations and Its Applications*
- Stephen McCarthy (Dr. Ida, University of Akron) - M.Sc., October 2014 - *Investigation of Power Reduction Methods for Multi-User MIMO WLAN Applications*
- Arindam Sengupta (Dr. Madanayake, University of Akron) - M.Sc., August 2014 - *Multi-dimensional Signal Processing Using Mixed-Microwave-Digital Circuits and Systems*
- Randeel Wimalagunaratne (Dr. Madanayake, University of Akron) - M.Sc., August 2013
- Suman Shrestha (Dr. Giakos, University of Akron) - M.Sc., May 2013 - *High Resolution Polarimetric Imaging Techniques for Space and Medical Applications*
- Mehdi Sadeghzadeh (Dr. Bahrami, University of Akron) - M.Sc., March 2013 - *Linear Precoding for Downlink Network MIMO Systems*

## COURSES TAUGHT Undergraduate

Year	Semester	Course
2012-To date	Spring	Computer Networks
2012-To date	Fall	Signals & Systems
2013	Spring	Digital Logic Design Lab

## Graduate

Year	Semester	Course
2021-To date	Fall	Stochastic Processes
2021-To date	Spring	Optimization for Machine Learning
2020-To date	Spring	Multi-User Communications
2011-To date	Fall	Information Theory
2014-To date	Spring	Error Control Coding

## PUBLICATIONS

### Books

1. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Amplify-and-Forward Relaying in Wireless Communications”, *Springer Briefs in Wireless Communications*, Springer, 2015.

### Refereed Journal Publications

75. A. R. Hossain, Md S. I. Sagar, **N. H. Tran**, P. K. Sekhar, and T. Karacolak, “Inkjet Printed Flexible High Isolation Patch Antenna for 5.8GHz Full-Duplex Applications”, *Progress In Electromagnetics Research C*, vol. 127, pp. 127-143, 2022.
74. L. V. Nguyen, N. Nguyen, **N. H. Tran**, L. Swindlehurst, M. Juntti, and D. H. N. Nguyen, “Leveraging Deep Neural Networks for Massive MIMO Data Detection”, *IEEE Wireless Communications Magazine*, to appear, 2022.
73. T. T. Nguyen, **N. H. Tran**, and T. Karacolak, “Dual polarized patch antenna array with improved isolation and gain for full-duplex wireless communications”, *Springer Nature Analog Integrated Circuits and Signal Processing*, pp. 1–10, July 2022.
72. **N. H. Tran**, H. A. Suraweera, T. Riihonen, N. Reiskarimian, H. Jain, and R. Schober, “Editorial – Special Issue on Full-Duplex Transceivers for Future Networks: Theory and Techniques”, *IEEE Open Journal of the Communications Society*, vol. 2, pp. 2463–2468, 2021.
71. L. K. Nguyen, D. H. N. Nguyen, R. Wells, and **N. H. Tran**, “Information Outage Probability and Constrained Capacity of Moderate-Length Codes over AWGN Channels”, *EAI Transactions on Industrial Networks and Intelligent Systems*, vol. 8, pp. 1–9, November 2021.

70. Md H. Rahman, M. Ranjbar, **N. H. Tran**, and K. Pham, “Optimal Signaling Schemes and Sum-Capacity of 1-bit ADC Fading 2-User MACs under Gaussian-Mixture Interference”, *Frontiers in Communications and Networks Journal – Communication Theory*, vol. 2, pp. 1–12, October 2021.
69. K. Lu, T. Nguyen, **N. H. Tran**, and T. Karacolak, “Parasitic Spirals for Enhancing Bandwidth of a Simultaneous Transmit and Receive Patch Antenna”, *Springer Microsystem Technologies*, vol. 27, pp. 3333–3338, Sept. 2021.
68. M. Ranjbar, H. L. Nguyen, **N. H. Tran**, T. Karacolak, and S. Sastry, “Energy Efficiency of Full-Duplex Cognitive Radio in Low-Power Regimes under Imperfect Spectrum Sensing”, *Springer Mobile Networks and Applications (MONET)*, vol. 64, pp. 1–15, Apr. 2021.
67. T. Sadig, M. Maleki, **N. H. Tran**, and H. Bahrami, “An Encryption-Aware PHY Security Framework for 4-Node Gaussian Wiretap Channels with Joint Power Constraint,” *IEEE Trans. Commun.*, vol. 68, no. 12, pp. 1425–1428, Dec. 2020.
66. H. Nguyen, D.-N. Nguyen, B. Vo, M. Tu, and **N. H. Tran**, “Full-Duplex MIMO-OFDM Systems with Imperfect Estimation of CFO and Time-Varying Multipath Channels”, *IEE Electronics Letters*, vol. 56, no. 25, pp. 7837–7850, Dec. 2020.
65. M. Ranjbar, **N. H. Tran**, M. Vu, T. V. Nguyen, and M. C. Gursoy, “Capacity region and capacity-achieving signaling schemes for 1-bit ADC multiple access channels in Rayleigh fading,” *IEEE Trans. Wireless Commun.*, vol. 19, no. 9, pp. 6162–6178, Sept. 2020.
64. M. Ranjbar, **N. H. Tran**, H. Nguyen-Le, and T. Karacolak, “Energy Efficiency of Uplink and Downlink Non-Orthogonal Multiple-Access Channels Under Gaussian-Mixture Interference,” *IEEE Trans. Green Commun. & Networking*, vol. 4, no. 3, pp. 657–688, Sept. 2020.
63. B. Tran, M. Elamin, **N. H. Tran**, and S. Sastry, “Performance Analysis of Software Defined Network Concepts in Networked Embedded Systems”, *Springer Mobile Networks and Applications (MONET)*, vol. 7, pp. 1–13, May 2020.
62. L. V. Nguyen, D. T. Ngo, **N. H. Tran**, L. Swindlehurst, and D. H. N. Nguyen, “Supervised and semisupervised learning for MIMO blind detection with low-resolution ADCs,” *IEEE Trans. Wireless Commun.*, vol. 19, no. 4, pp. 2427–2442, Apr. 2020.
61. Md H. Rahman, M. Ranjbar, and **N. H. Tran**, “On the Capacity-Achieving Scheme and Capacity of 1-Bit ADC Gaussian-Mixture Channels,” *EAI Transactions on Industrial Networks and Intelligent Systems*, vol. 7, pp. 1–10, Jan. 2020.
60. M. Vu, **N. H. Tran**, G. Dissanayakage, K. Pham, K-S Lee, and D. H. N. Nguyen, “Optimal Signaling Schemes and Capacity of Non-Coherent Rician Fading Channels with Low-Resolution Output Quantization”, *IEEE Trans. Wireless Commun.*, vol. 18, pp. 2989–3004, June 2019.
59. **N. H. Tran**, Duy H. N. Nguyen, Gayan A.Baduge, Zhu Han, and Nallanathan Arumugam, “Editorial on Technologies and Designs for Cooperative and Heterogeneous Vehicular Networks”, *Elsevier Physical Communication*, vol. 34, pp. 283-284, June 2019.
58. C. Goodbody, **N. H. Tran**, and T. Karacolak, “Patch Antenna for Full-Duplex Application with Improved Isolation using Defected Ground Structure”, *Progress In Electromagnetics Research Letters*, vol. 84, pp. 91–97, May 2019.
57. H. Vu, **N. H. Tran**, T. Le-Ngoc, “Full-Duplex Device-to-Device Cellular Networks: Power Control and Performance Analysis”, *IEEE Trans. Vehicular Technology.*, vol. 68, p. 3952–3966, April 2019.
56. M. Vu, **N. H. Tran**, H. D. Tuan, T. V. Nguyen, and D. H. N. Nguyen, “Optimal Signaling Schemes and Capacities of Non-Coherent Correlated MISO Channels under Per-Antenna Power Constraints”, *IEEE Trans. Commun.*, vol. 67, p. 190–204, January 2019.
55. C. Goodbody, T. Karacolak, and **N. H. Tran**, “A Dual-Polarized Patch Antenna for In-Band Full-Duplex Applications”, *IEE Electronics Letters*, vol. 54, p. 1255–1256, November 2018.
54. M. Ranjbar, **N. H. Tran**, T. Nguyen, and M. C. Gursoy, “Capacity-Achieving Signals for Point-to-Point and Multiple-Access Channels under Non-Gaussian Noise and Peak Power Constraint”, *IEEE Access*, vol. 6, pp. 30977–30989, May 2018.
53. A. Alizadeh, H. Bahrami, M. Maleki, **N. H. Tran**, and P. Mohseni, “On the Coexistence of Nanonetworks: Sensing Techniques for Molecular Communications”, *IEEE Trans. Molecular, Biological and Multi-Scale Commun.*, vol. 3, pp. 209–223, December 2017.
52. G. Makar, D. Kim, **N. H. Tran**, and T. Karacolak, “Compact antennas with reduced self-interference for simultaneous transmit and receive”, *Progress In Electromagnetics Research C*,



- vol. 78, pp. 19–31, September 2017.
51. L. Elsaid, L. J. Rodrigue, **N. H. Tran**, S. Shetty, and S. Sastry, “Secrecy Rates and Optimal Power Allocation for Full-Duplex Decode-and-Forward Relay Wire-Tap Channels”, *IEEE Access*, vol. 5, pp. 10469–10477, June 2017.
  50. G. Makar, **N. H. Tran**, and T. Karacolak, “A High Isolation Monopole Array with Ring Hybrid Feeding Structure for In-Band Full-Duplex Systems”, *IEEE Antenna and Wireless Propagation Letters*, vo. 16, pp. 356–359, 2017.
  49. C. Dang, L. J. Rodrigue, **N. H. Tran**, S. Shetty, and S. Sastry, “On Secrecy Rate and Optimal Power Allocation of the Full-Duplex Amplify-and-Forward Relay Wire-Tap Channel”, *IEEE Trans. Veh. Tech.*, vol. 34, pp. 3887–3899, May 2017.
  48. G. Ozcan, M. C. Gursoy, **N. H. Tran**, and J. Tang, “Energy-Efficient Power Allocation in Cognitive Radio Systems with Imperfect Spectrum Sensing”, *IEEE Journal on Sel. Areas in Commun.*, vol. 34, pp. 3466–3481, December 2016.
  47. A. D. Le, H. V. Vu, **N. H. Tran**, M. C. Gursoy, and T. Le-Ngoc, “Approximation of Achievable Rates in Additive Gaussian Mixture Noise Channels”, *IEEE Trans. Commun.*, vol. 64, pp. 5011–5024, December 2016.
  46. A. D. Le, H. V. Vu, M. Ranjbar, **N. H. Tran**, T. Karacolak, and T. M. Hoang, “On the Capacity and Energy Efficiency of Non-Coherent Rayleigh Fading Channels with Additive Gaussian Mixture Noise”, *IET Commun.*, vol. 10, pp. 2507–2515, December 2016.
  45. M. Sadeghzadeh, H. R. Bahrami, and **N. H. Tran**, “Clustered Linear Precoding for Downlink Network MIMO Systems with Partial CSI”, *Wiley Wireless Communications and Mobile Computing*, vol. 16, pp. 2340–2355, October 2016.
  44. S. Herath, D. H. N. Nguyen, **N. H. Tran**, and T. Le-Ngoc, “On the Sum-Rate of BICM-ID Transmission Over Vector-Perturbation Precoding in Multi-User Downlink”, *IEEE Trans. Veh. Tech.*, vol. 65, pp. 7769–7773, September 2016.
  43. C. Dang, L. J. Rodrigue, **N. H. Tran**, F. S. Bao, and S. Sastry, “Secrecy Rate and Optimal Power Allocation of the Amplify-and-Forward Relay Wire-Tap System”, *Journal of Science and Technology (The University of Danang)*, September 2016.
  42. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Optimal Power Allocation Schemes for the Single AF Relay and Jammer Wiretap Channels”, *IEEE Trans. Veh. Tech.*, vol. 65, pp. 3042–3056, May 2016.
  41. L. J. Rodriguez, **N. H. Tran**, T. Q. Duong, T. Le-Ngoc, M. El Kashlan, and S. Shetty, “Physical Layer Security in Wireless Cooperative Relay Networks: State-Of-The-Art and Beyond”, pp. 1–8, *IEEE Commun. Magazine*, December 2015.
  40. A. D. Le, S. Herath, **N. H. Tran**, T. Q. Duong, and S. Shetty, “Achievable Rates and Outage Probability of Cognitive Radio with Dynamic Frequency Hopping Under Imperfect Spectrum Sensing”, *IET Commun.*, vol. 9, pp. 2160–2167, November 2015.
  39. H. V. Vu, **N. H. Tran**, M. C. Gursoy, T. Le-Ngoc, and S. I. Hariharan, “Capacity-Achieving Input Distributions of Additive Quadrature Gaussian-Mixture Noise Channels”, *IEEE Trans. Commun.*, vol. 63, pp. 3607–3620, October 2015.
  38. A. D. Le, H. V. Vu, **N. H. Tran**, and B. N. Q. Vo, “Capacity of Bernoulli-Gaussian Interference Channels in Rayleigh Fading with Full CSI”, *Journal of Science and Technology (The University of Danang)*, no. 6(91).2015, vol. 2, pp. 1-6, September 2015 (**Invited Paper**).
  37. R. Kumarasiri, K. Alshamaileh, **N. H. Tran**, and V. Devabhaktuni, “An Improved Hybrid RSS/TDOA Wireless Sensors Localization Technique Utilizing Wi-Fi Networks”, *Springer Journal of Mobile Networks and Applications*, DOI 10.1007/s11036-015-0622-3, pp. 1-10, June 2015.
  36. **N. H. Tran**, L. J. Rodriguez, and T. Le-Ngoc, “Optimal Power Control and Error Performance for Full-Duplex Dual-Hop AF Relaying under Residual Self-Interference”, *IEEE Commun. Letters*, vol. 19, pp. 291–294, February 2015.
  35. S. Herath, **N. H. Tran**, and T. Le-Ngoc, “Optimal Signalling Scheme and Capacity Limit of PLC under Bernoulli-Gaussian Impulsive Noise”, *IEEE Trans. Power Delivery*, vol. 30, pp. 97–105, February 2015.
  34. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Performance of Full-Duplex AF Relaying in the Presence of Residual Self-Interference”, *IEEE Journal on Sel. Areas in Commun.*, vol. 32, pp. 1752–1764, September 2014.
  33. H. V. Vu, **N. H. Tran**, T. V. Nguyen, and S. I. Hariharan, “Estimating Shannon and

- Constrained Capacities of Bernoulli-Gaussian Impulsive Noise Channels in Rayleigh Fading”, *IEEE Trans. Commun.*, vol. 62, pp. 1845-1856, June 2014.
32. L. Wang, M. ElKashlan, J. Huang, **N. H. Tran**, and T. Q. Duong, “Secure Transmission with Optimal Power Allocation in Untrusted Relay Networks”, *IEEE Wireless Commun. Letters*, vol. 3, pp. 289-292, June 2014.
  31. T. X. Tran, **N. H. Tran**, H. R. Bahrami, and S. Sastry, “On Achievable Rate and Ergodic Capacity of NAF Multi-Relay Networks with CSI”, *IEEE Trans. Commun.*, vol. 62, pp. 1490-1502, May 2014.
  30. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Achievable Rate and Power Allocation for Single-Relay AF Systems over Rayleigh Fading Channels at High and Low SNRs”, *IEEE Trans. Veh. Tech.*, vol. 63, pp. 1726-1739, May 2014.
  29. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Optimal Power Allocation and Capacity of Full-Duplex AF Relaying under Residual Self-Interference”, *IEEE Wireless Commun. Letters*, vol. 3, pp. 233-236, April 2014.
  28. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “On the Capacity of the Static Half-Duplex Non-orthogonal AF Relay Channel”, *IEEE Trans. Wireless Commun.*, vol. 13, pp. 1034-1046, Feb. 2014.
  27. M. Maleki, H. R. Bahrami, Ardalan Alizadeh, and **N. H. Tran**, “On the Performance of Spatial Modulation: Optimal Constellation Breakdown”, *IEEE Trans. Commun.*, vol. 62, pp. 144-157, Jan. 2014.
  26. L. J. Rodriguez, **N. H. Tran**, A. Helmy, and Tho Le-Ngoc, “Optimal Power Adaption for Cooperative AF Relaying with Channel Side Information”, *IEEE Trans. Veh. Tech.*, vol. 62, pp. 3164-3174, Sept. 2013.
  25. **N. H. Tran**, L. J. Rodriguez, Tho Le-Ngoc, and H. R. Bahrami, “Precoding and Symbol Grouping for NAF Relaying in BICM systems”, *IEEE Trans. Veh. Tech.*, vol. 62, pp. 2607-2617, Jul. 2013.
  24. M. Maleki, H. R. Bahrami, S. Beygi, M. Kafashan, and **N. H. Tran**, “Space Modulation with CSI: Constellation Design and Performance Evaluation”, *IEEE Trans. Veh. Tech.*, vol. 62, pp. 1623-1634, May 2013.
  23. S. Herath, **N. H. Tran**, and Tho Le-Ngoc, “Rotated Multi-D Constellations in Rayleigh Fading: Mutual Information Improvement and Pragmatic Approach for Near-Capacity Performance in High-Rate Regions”, *IEEE Trans. Commun.*, vol. 60, pp. 3694-3704, Dec. 2012.
  22. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Multiple-Frame Precoding for NAF Relaying over Rayleigh Fading Channels”, *IEEE Trans. Veh. Tech.*, vol. 61, pp. 398-404, January 2012.
  21. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Multiple-Frame Precoding and Multi-D Mapping for BICM over Ergodic NAF Relay Channels”, *Wiley Journal in Wireless Commun. and Mobile Computing*, vol. 11, pp. 1564-1575, December 2011.
  20. Hung Nguyen-Le, Tho Le-Ngoc, and **N. H. Tran**, “Iterative Receiver Design with Joint Doubly Selective Channel and CFO Estimation for Coded MIMO-OFDM Transmissions”, *IEEE Trans. Veh. Tech.*, vol. 60, pp. 4052-4057, October 2011.
  19. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Bandwidth-efficient Bit-interleaved Coded Modulation over NAF Relay Channels: Error Performance and Precoder Design” *IEEE Trans. Veh. Tech.*, vol. 60, pp. 2086-2101, June 2011.
  18. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Jointly Optimal Precoder and Power Allocation for an Amplify-and-Forward Half-Duplex Relay System”, *REV Journal on Electronics and Commun.*, vol. 1, pp. 38-44, March 2011.
  17. **N. H. Tran**, Tho Le-Ngoc, Tad Matsumoto, and Ha H. Nguyen, “Achieving Near-Capacity Performance on Multiple-Antenna Channels with A Simple Concatenation Scheme”, *IEEE Trans. Commun.*, vol. 58, pp. 1048-1059, April 2010.
  16. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Performance Analysis and Design Criteria of BICM-ID with Signal Space Diversity for Keyhole Nakagami- $m$  Fading Channels”, *IEEE Trans. Inform. Theory*, vol. 55, pp. 1592-1602, April 2009.
  15. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Application of Signal Space Diversity over Multiplicative Fading Channels”, *IEEE Signal Process. Letters*, vol. 16, pp. 204-207, March 2009.
  14. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “On Symbol and Bit Error Probabilities of Orthogonal Space-Time Block Codes with Antenna Selection over Keyhole Fading Channels”,

*IEEE Trans. Wireless Commun.*, vol. 56, pp. 4818-4824, December 2008.

13. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "BICM-ID with Signal Space Diversity over Cascaded Rayleigh Fading Channels", *IEEE Trans. Commun.*, vol. 56, pp. 1561-1568, October 2008.
12. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Multi-dimensional Subcarrier Mapping for Bit-Interleaved Coded OFDM with Iterative Decoding", *IEEE Trans. on Signal Process.*, vol. 55, pp. 5772-5781, December 2007.
11. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Subcarrier Grouping for OFDM with Linear Constellation Precoding Over Multipath Fading Channels", *IEEE Trans. Veh. Tech.*, vol. 56, pp. 3607-3613, September 2007.
10. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Performance Bounds of Orthogonal Space-Time Block Codes over Keyhole Nakagami- $m$  Channels", *IEEE Signal Process. Letters*, vol. 14, pp. 605-608, September 2007.
9. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Performance of BICM-ID with Signal Space Diversity", *IEEE Trans. Wireless Commun.*, vol. 6, pp. 1732-1742, May 2007.
8. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Coded Unitary Space-Time Modulation with Iterative Decoding: Error Performance and Mapping Design", *IEEE Trans. Commun.*, vol. 55, pp. 703-716, April 2007.
7. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, "Bit-interleaved coded OFDM with Signal Space Diversity: Subcarrier Grouping and Rotation Matrix Design", *IEEE Trans. Signal Process.*, vol. 55, pp. 1137-1149, March 2007.
6. **N. H. Tran** and Ha H. Nguyen, "A Novel Multi-Dimensional Mapping of 8-PSK for BICM-ID", *IEEE Trans. Wireless Commun.*, vol. 6, pp. 1133-1142, March 2007.
5. **N. H. Tran** and Ha H. Nguyen, "Design and Performance of BICM-ID Systems with Hypercube Constellation", *IEEE Trans. Wireless Commun.*, vol. 5, pp. 1169-1179, May 2006.
4. **N. H. Tran** and Ha H. Nguyen, "Multi-Dimensional Mappings of  $M$ -ary Constellations for BICM-ID Systems", *IEICE Trans. Fundamentals*, vol. E89-A, pp. 2088-2091, July 2006.
3. **N. H. Tran** and Ha H. Nguyen, "Signal Constellations and Mappings for 8-ary BICM-ID Systems", *IEEE Trans. Broadcasting*, vol. 52, pp. 92-99, March 2006.
2. Ha H. Nguyen and **N. H. Tran**, "Bonferroni-Type Bounds for CDMA Systems with Nonuniform Signalling", *IEEE Commun. Letters*, vol. 9, pp. 583-585, July 2005.
1. **N. H. Tran** and Ha H. Nguyen, "Signal Mappings of 8-ary Constellations for BICM-ID Systems over a Rayleigh Fading Channel", *IEICE Trans. Commun.*, vol. E88-B, pp. 4083-4086, October 2005.

#### Refereed Conference Papers

92. T. Sadig, M. Maleki, **N. H. Tran**, and H. Bahrami, "Encryption-Aided Physical Layer Security via Cooperative Jamming: Beyond Secrecy Capacity with Noisy Ciphertext", in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC) - Workshop on Physical Layer Security*, Glasgow, UK, March 2023, pp. 1-6.
91. L. K. Nguyen, D. H. N. Nguyen, **N. H. Tran**, C. Bosler, and D. Brunnenmeyer, "Coordinated Multi-Agent Q-Learning for Resilient SATCOM Against Smart Jammers", in *Proc. IEEE Milcom*, Rockville, Maryland, USA, December 2022, pp. 1-6 (Restricted Access).
90. S. Banik, Md H. Rahman, M. Ranjbar, **N. H. Tran**, and K. Pham, "Sum-Capacity Achieving Schemes of a 2-User Gaussian Multiple-Access Channel With 1-Bit ADC", in *Proc. IEEE Milcom*, Rockville, Maryland, USA, December 2022, pp. 1-6.
89. A. R. Hossain, A. A. Mervyy, **N. H. Tran**, and T. Karacolak, "A High Gain Flexible Antenna for Full Duplex System at 5.8 GHz with Defected Ground Structure", in *Proc. IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science*, Denver, USA, July 2022, pp. 1-2.
88. M. Ranjbar, **N. H. Tran**, T. Karacolak, and S. Sastry "Rate Region and Achievable Rates of Full-Duplex Cognitive Radio NOMA Channels under Imperfect Spectrum Sensing", in *Proc. Industrial Networks and Intelligent Systems (INISCOM)*, Danang, Vietnam, April 2022, pp. 1-16 (**Best Paper Award**).
87. Md H. Rahman, M. Ranjbar, **N. H. Tran**, and K. Pham, "Optimal Signaling Schemes of 2-User Gaussian Mixture Multiple-Access Channels With 1-Bit ADC", in *Proc. IEEE Milcom*, San Diego, USA, November 2021, pp. 1-6.

86. L. K. Nguyen, D. H. N. Nguyen, **N. H. Tran**, C. Bosler, and D. Brunnenmeyer, "SATCOM Jamming Resiliency Under Non-Uniform Probability of Attacks", in *Proc. IEEE Milcom*, San Diego, USA, November 2021, pp. 1-6.
85. Md H. Rahman, M. Ranjbar, **N. H. Tran**, and K. Pham, "Capacity-Achieving Signal and Capacity of Gaussian Mixture Channels with 1-bit Output Quantization", in *Proc. IEEE Int. Conf. on Commun. (ICC) – Signal Processing*, Republic of Ireland, June 2020, pp. 1-6.
84. L. K. Nguyen, R. B. Wells, D. H. N. Nguyen, and **N. H. Tran**, "Outage Probability and Performance of Moderate-Length Codes Under Partial-Band Noise Jamming (PBNJ)", in *Proc. IEEE Milcom*, Norfolk, USA, October 2019, pp. 1–5.
83. B. Tran, M. Elamin, **N. H. Tran**, and S. Sastry, "Performance Analysis of Software Defined Network Concepts in Networked Embedded Systems", in *Proc. Industrial Networks and Intelligent Systems (INISCOM)*, Ho Chi Minh City, Vietnam, August 2019, pp. 1–10.
82. K. Lu, C. Goodbody, T. Karacolak, and **N. H. Tran**, "An Interior Parasitic Patch Antenna with Wide Isolation Bandwidth for Simultaneous Transmit and Receive (STAR)", in *Proc. IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science*, Atlanta, USA, July 2019.
81. M. Ranjbar, H. Le-Nguyen, T. Karacolak, and **N. H. Tran**, "Energy Efficiency of NOMA-based Wireless Networks Under Gaussian-Mixture Interference", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Green Commun.*, Shanghai, China, May 2019, pp. 1–6.
80. M. Ranjbar, M. Vu, **N. H. Tran**, K. Pham, and D. H. N. Nguyen, "On the Sum-Capacity-Achieving Distributions and Sum-Capacity of 1-Bit ADC MACs in Rayleigh Fading", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Commun.*, Shanghai, China, May 2019, pp. 1–6.
79. M. Ranjbar, H. Le-Nguyen, and **N. H. Tran**, "Energy Efficiency of Broadcast Wireless Channels Under Non-Gaussian Aggregate Interference", in *Proc. IEEE Int. Conf. on Consumer Electronics (ICCE)*, Taipei, Taiwan, May 2019, pp. 1–2 (**Best Paper Award**).
78. L. K. Nguyen, R. B. Wells, D. H. N. Nguyen, and **N. H. Tran**, "Outage Probability and Constrained Capacity of Moderate-Length Codes for Gaussian Mixture over AWGN Channel", in *Proc. IEEE Milcom*, Los Angeles, USA, October 2018, pp. 1–6.
77. M. Vu, **N. H. Tran**, H. D. Tuan, T. V. Nguyen, and D. H. N. Nguyen, "On Optimal Input and Capacity of Non-Coherent Correlated MISO Channels Under Per-Antenna Power Constraints", in *Proc. IEEE Int. Conf. Commun. Electron. (ICCE)*, Hue, Vietnam, July 2018, pp. 1-6.
76. C. Goodbody, K. Lu, **N. H. Tran**, and T. Karacolak, "A Compact Patch Antenna with Improved Isolation for Simultaneous Transmit and Receive", in *Proc. IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science*, Boston, USA, July 2018.
75. M. Ranjbar, **N. H. Tran**, T. Nguyen, and M. C. Gursoy, "Optimal Inputs of Single-User and Multi-User non-Gaussian Aggregate Interference Channels", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Commun. Theory*, Kansas, USA, May 2018, pp. 1-6.
74. H. Vu, **N. H. Tran**, and T. Le-Ngoc, "On Coverage Probabilities and Sum-Rate of Full-Duplex Device-to-Device Cellular Networks", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Commun.*, Kansas, USA, May 2018, pp. 1-6.
73. M. Vu, G. Dissanayakage, **N. H. Tran**, and K. D. Pham, "Optimal Signaling Scheme and Capacity of Non-Coherent Rician Fading Channels with 1-Bit Output Quantization", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Signal Processing*, Kansas, USA, May 2018, pp. 1-6.
72. L. V. Nguyen, D. T. Ngo, **N. H. Tran**, and D. H. N. Nguyen, "Learning Methods for MIMO Blind Detection with Low-Resolution ADCs", in *Proc. IEEE Int. Conf. on Commun. (ICC) - Signal Processing*, Kansas, USA, May 2018, pp. 10-6.
71. L. K. Nguyen, R. B. Wells, D. H. N. Nguyen, and **N. H. Tran**, "Outage Probability Analysis of the Protected Tactical Waveform (PTW) on the Return Link", in *Proc. IEEE Milcom*, Baltimore, USA, October 2017, pp. 1–6.
70. C. Goodbody, G. Makar, **N. H. Tran**, and T. Karacolak, "A Dual-Polarized Patch Antenna for In-Band Full-Duplex Communications", in *Proc. IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science*, San Diego, USA, July 2017.
69. L. Esaid, M. Ranjbar, N. Raymondi, D. H. N. Nguyen, **N. H. Tran**, and, A. Mahamadi, "Full-Duplex Decode-and-Forward Relaying: Secrecy Rates and Optimal Power Allocation",

- in *Proc. IEEE VTC*, Sydney, Australia, June 2017, pp. 1-6.
68. M. Ranjbar, N. Raymondi, **N. H. Tran**, and, T. Karacolak, “Energy Efficiency of Full Duplex Cognitive Radio under Imperfect Spectrum Sensing”, in *Proc. IEEE COMSNET-Graduate Forum*, Bangalore, India, January 2017, pp. 1-2.
  67. N. Raymondi, M. Seredich, T. Karacolak, **N. H. Tran**, and D. H. N. Nguyen, “Compact and Power-Efficient 5 GHz Full-Duplex Design Utilizing the 180° Ring Hybrid Coupler”, in *Proc. IEEE SigTelCom*, Da Nang, Vietnam, January 2017, pp. 1–5 (**Best Student Paper Award**).
  66. D. A. Le, H. V. Vu, **N. H. Tran**, M. C. Gursoy, and T. Le-Ngoc, “Numerical Calculation of Information Rates and Capacity of Quadrature Gaussian Mixture Channels”, in *Proc. IEEE Int. Conf. Commun. Electron. (ICCE)*, Ha Long, Vietnam, July 2016, pp. 1-6 (**Best Student Paper Award**).
  65. G. Makar, S. Seran, **N. H. Tran**, and T. Karacolak, “Differential-Fed Patch Antenna with Ring Hybrid Feeding Structure for Simultaneous Transmit and Receive (STAR) Systems”, in *Proc. IEEE International Symposium on Antennas and Propagation/USNC-URSI National Radio Science*, Puerto Rico, USA, June 2016, pp. 1.
  64. M. Ranjbar, **N. H. Tran**, M. C. Gursoy, and H. R. Bahrami, “Energy Efficiency of Channels under Additive Gaussian-Mixture Noise in the Low-Power Regime”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Green Communications Systems and Networks (GCSN)*, Kuala Lumpur, Malaysia, May 2016, pp. 1-6.
  63. D. A. Le, H. V. Vu, **N. H. Tran**, M. C. Gursoy, and T. Le-Ngoc, “Estimation of Achievable Rates in Additive Gaussian Mixture Noise Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Commun. Theory*, Kuala Lumpur, Malaysia, May 2016, pp. 1-6.
  62. C. Dang, L. Elsaid, L. J. Rodriguez, **N. H. Tran**, and S. Sastry, “Ergodic Secrecy Rates of the Full-Duplex AF and DF Relay Wire-Tap Fading Channels”, in *Proc. IEEE European Wireless (EW)*, Oulu, Finland, May 2016, pp. 1-5.
  61. M. Chippa, M. Elamin, S. Sastry, and **N. H. Tran**, “Dynamic TDMA for Networked Embedded Systems”, in *Proc. International Conference on Information Science and Applications (ICISA)*, Ho Chi Minh City, Vietnam, February 2016.
  60. G. Makar, S. Seran, **N. H. Tran**, and T. Karacolak, “Compact Antennas with Reduced Self Interference for In-Band Full-Duplex Systems”, in *Proc. IEEE National Radio Science Meeting (NRSM)*, Boulder, Colorado, USA, January 2016.
  59. D. A. Le, H. V. Vu, **N. H. Tran**, H. Dinh, and T. Karacolak, “Capacity-Achieving Signals of Non-Coherent Rayleigh Fading Channels with Additive Gaussian Mixture Noise”, in *Proc. IEEE ComManTel*, Da Nang, Vietnam, December 2015, pp. 1–5 (**Best Paper Award**).
  58. Yaowei Yan, **N. H. Tran**, and F. S. Bao, “Gossiping Along the Path: A Direction-Biased Routing Scheme for Wireless Ad Hoc Networks” in *Proc. IEEE Global Telecommun. Conf. (Globecom)*, San Diego, California, USA, December 2015.
  57. H. V. Vu, **N. H. Tran**, M. C. Gursoy, T. Le-Ngoc, and S. I. Hariharan, “Characterization of Optimal Input Distributions for Gaussian-Mixture Noise Channels”, in *Proc. Canadian Workshop on Information Theory (CWIT)*, St. John, NL, Canada, Jul. 2015 (**Best Paper Runner-up**).
  56. C. Dang, L. J. Rodriguez, D. A. Le, F. S. Bao, and **N. H. Tran**, “Secrecy Rate of the Amplify-and-Forward Relay Wire-Tap Channel in Rayleigh Fading”, in *Proc. International Conference on Mobile and Wireless Technology (ICMWT)*, Bangkok, Thailand, June 2015.
  55. H. V. Vu, **N. H. Tran**, M. C. Gursoy, T. Le-Ngoc, and S. I. Hariharan, “Capacity-Achieving Distributions of Impulsive Ambient Noise Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Commun. Theory*, London, UK, Jun. 2015.
  54. D. A. Le, **N. H. Tran**, S. Shetty, and S. Sastry, “Achievable Rate and Outage Probability of Cognitive Radio with Finite-Alphabet Inputs Under Imperfect Spectrum Sensing”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Glasgow, Scotland, May 2015.
  53. C. Dang, L. J. Rodriguez, **N. H. Tran**, S. Shetty, and S. Sastry, “Secrecy Capacity of the Full-Duplex AF Relay Wire-Tap Channel under Residual Self-Interference”, in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC)*, New Orleans, USA, Mar. 2015.
  52. T. Q. Duong, D. T. Tran, M. Elakashlan, **N. H. Tran**, and O. A. Dobre, “Secured Cooperative Cognitive Radio Networks with Relay Selection” in *Proc. IEEE Global Telecommun. Conf. (Globecom)*, Austin, Texas, USA, December 2014.

51. D. A. Le, H. V. Vu, **N. H. Tran**, T. Q. Duong, and D. T. Ngo, “Numerical Calculation of Achievable Rates for Cognitive Radio with Dynamic Frequency Hopping Under Imperfect Spectrum Sensing”, in *Proc. IEEE Int. Conf. Commun. Electron. (ICCE)*, Da Nang, Vietnam, August 2014.
50. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Optimal Power Allocation Schemes for Single-Relay AF Wire-Tap Channels”, in *Proc. IEEE Int. Conf. Commun. Electron. (ICCE)*, Da Nang, Vietnam, August 2014.
49. M. Sadeghzadeh, H. R. Bahrami, and **N. H. Tran**, “Clustered Precoding for Coordinated Multi-Cell Systems Based on Signal-to-Leakage Ratios”, in *Proc. IEEE Int. Conf. Commun. Electron. (ICCE)*, Da Nang, Vietnam, August 2014.
48. H. V. Vu, **N. H. Tran**, T. V. Nguyen, and S. I. Hariharan, “Estimating Information Rates of Bernoulli-Gaussian Impulsive Noise Channels in Rayleigh Fading”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Commun.*, Sydney, Australia, Jun. 2014.
47. L. J. Rodriguez, **N. H. Tran**, and T. Le-Ngoc, “Performance Evaluation of Full-Duplex AF Relaying with Direct Link under Residual Self-Interference”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Commun.*, Sydney, Australia, Jun. 2014.
46. T. X. Tran, **N. H. Tran**, T. Q. Duong, M. Elkashlan, and H. R. Bahrami, “MRC-Based Relay Precoding for Cooperative AF Multi-Antenna Relay Networks with CSI Paper,” in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Seoul, Korea, May 2014.
45. H. V. Vu, D. A. Le, **N. H. Tran**, and B. V. Q. Nguyen, “Capacity of Bernoulli-Gaussian Interference Channels in Rayleigh Fading with Full CSI”, in *Proc. Third World Congress on Information and Communication Technologies (WICT)*, Hanoi, Vietnam, Dec. 2013.
44. H. V. Vu, **N. H. Tran**, T. V. Nguyen, and S. I. Hariharan, “On the Capacity of Bernoulli-Gaussian Impulsive Noise Channels in Rayleigh Fading”, in *Proc. IEEE Inter. Symp. on Personal, Indoor and Mobile Radio Commun. (PIMRC)*, London, UK, Sept. 2013.
43. T. M. Syed, **N. H. Tran**, T. X. Tran, and Z. Han, “Precoder Design for a Single-Relay Non-Orthogonal AF System based on Mutual Information”, in *Proc. IEEE Int. Wireless Commun. & Mobile Comput. Conf. (IWCMC)*, Cagliari, Italy, July 2013.
42. T. M. Syed and **N. H. Tran**, “Optimal 2 x 2 Space-Time Block Codes Based On Mutual Information in Rayleigh fading”, in *Proc. IEEE Canadian Conf. on Electrical and Comput. Engineering (CCECE)*, Regina, Saskatchewan, Canada, May 2013.
41. T. X. Tran, **N. H. Tran**, and H. R. Bahrami, “Optimal Power Sharing Strategies in NAF Multiple-Relay Networks with CSI”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Signal Process.*, Budapest, Hungary, Jun. 2013.
40. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Achievable Rates and Power Allocation for Two-Way AF Relaying over Rayleigh Fading Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Commun.*, Budapest, Hungary, Jun. 2013.
39. T. X. Tran, **N. H. Tran**, H. R. Bahrami, H. Dinh, and S. Sastry, “On Achievable Rate and Ergodic Capacity of OAF Multiple-Relay Networks with CSI”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Dresden, Germany, Jun. 2013.
38. M. Kafashan, S. Beygi, M. Maleki, A. Danaee, **N. H. Tran**, and H. R. Bahrami, “Channel Regularization and Vector Perturbation for Dual-Hop Precoded AF Relaying in Downlink Transmission”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Dresden, Germany, Jun. 2013.
37. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Achievable Sum-Rate of Two-Way AF Relay Networks with Relay Adaptation”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Dresden, Germany, Jun. 2013.
36. M. Sadeghzadeh, H. R. Bahrami, and **N. H. Tran**, “Clustered Linear Precoding for Downlink Network MIMO Systems With Partial CSI”, in *Proc. IEEE Inter. Conf. on Computing, Networking and Commun. (ICNC)*, San Diego, USA, Jan. 2013.
35. S. Herath, **N. H. Tran**, and Tho Le-Ngoc, “Capacity Limit of Cognitive Radio with Dynamic Frequency Hopping Under Imperfect Spectrum Sensing”, in *Proc. IEEE Inter. Symp. on Personal, Indoor and Mobile Radio Commun. (PIMRC)*, Sydney, Australia, Sept. 2012.
34. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Capacity and Power Allocation of Dual-Hop AF Relaying over Rayleigh Fading Channels”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Quebec City, QC, Canada, Sept. 2012.
33. A. Madanayake, C. Wijenayake, **N. H. Tran**, Todor Cooklev, Sean Hum, and Leonard Bruton, “Directional Spectrum Sensing using Tunable Multi-D Space-Time Discrete Filters”, in

- IEEE Workshop on Emerging COgnitive Radio Applications and ALgorithms (CORAL)*, San Francisco, CA, USA, Jul. 2012.
32. S. Herath, **N. H. Tran**, and Tho Le-Ngoc, “On Optimal Input Distribution and Capacity Limit of Bernoulli-Gaussian Impulsive Noise Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - SAC - Powerline Communications*, Ottawa, Canada, June 2012.
  31. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Capacity Limit of Static Single-Relay Amplify-and-Forward Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Communications Theory*, Ottawa, Canada, June 2012.
  30. L. J. Rodriguez, A. Helmy, **N. H. Tran**, and Tho Le-Ngoc, “Optimal Power Adaption for NAF Relaying with Channel Side Information”, in *Proc. IEEE Int. Conf. on Commun. (ICC) - Wireless Communications Symposium*, Ottawa, Canada, June 2012.
  29. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “On Achievable Rate and Ergodic Capacity of Non-Symmetric Half-Duplex NAF Relay Channels”, in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC)*, Paris, France, April 2012.
  28. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Capacity-Approaching Design for Half-Duplex NAF Relay Channels”, in *Proc. 74th IEEE Veh. Tech. Conf. (VTC)*, San Francisco, CA, USA, September 2011.
  27. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Multiple-Frame Precoding Scheme for BICM over AF Relay Channels”, in *Proc. IEEE IWCMC*, Istanbul, Turkey, July 2011.
  26. S. Herath, **N. H. Tran**, and Tho Le-Ngoc, “Rotated Multi-D Constellations in Rayleigh Fading: Mutual Information Improvement and Pragmatic Approach for Near-Capacity Performance”, in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC)*, Cancun, Mexico, March 2011.
  25. **N. H. Tran**, L. J. Rodriguez, and Tho Le-Ngoc, “Optimal Precoder and Symbol Grouping for Bandwidth-Efficient Bit-interleaved Coded Modulation over NAF Single-Relay Channels” in *Proc. IEEE Global Telecommun. Conf. (Globecom)*, Miami, USA, December 2010.
  24. Hung Le-Nguyen, Tho Le-Ngoc, and **N. H. Tran**, “Bayesian Joint Estimation of CFO and Doubly Selective Channels in MIMO-OFDM Transmissions” in *Proc. 72nd IEEE Veh. Tech. Conf. (VTC)*, Ottawa, Canada, September 2010, pp. 1–5.
  23. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Jointly Optimal Precoder and Power Allocation for the Amplify-and-Forward Half-Duplex Relay System” in *Proc. IEEE ICCE*, NhaTrang, Vietnam, August 2010.
  22. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Optimal Amplify-and-Forward Scheme based on Superposition Modulation over Relay Channels” in *Proc. IEEE CCECE*, Calgary, Alberta, Canada, May 2010.
  21. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “High-Rate BICM-ID with Superposition Modulation over Amplify-and-Forward Relay Channels” in *Proc. 25th Biennial Symposium on Communications*, Queen’s University, Kingston, Canada, May 2010.
  20. L. J. Rodriguez, **N. H. Tran**, and Tho Le-Ngoc, “Bandwidth-efficient Bit-interleaved Coded Modulation over NAF Relay Channels: Error Performance and Precoder Design” in *Proc. IEEE Int. Conf. on Commun. (ICC)*, Cape Town, South Africa, May 2010.
  19. Hung Le-Nguyen, Tho Le-Ngoc, and **N. H. Tran**, “Iterative Receiver Design with Joint Channel Estimation and Synchronization for Coded MIMO-OFDM over Doubly Selective Channels” in *Proc. IEEE Global Telecommun. Conf. (Globecom)*, Hawaii, USA, December 2009.
  18. **N. H. Tran**, Tho Le-Ngoc, Tad Matsumoto, and Ha H Nguyen, “Achieving Close-Capacity Performance with Simple Concatenation Scheme on Multiple-Antenna Channels” in *Proc. IEEE Global Telecommun. Conf. (Globecom)*, Hawaii, USA, December 2009.
  17. **N. H. Tran**, Tho Le-Ngoc, Tad Matsumoto, and Ha H. Nguyen, “A Simple Near-Capacity Concatenation Scheme Over MISO Channels” in *Proc. Sixth Int. Conf. on Broadband Commun., Networks, and Systems (BROADNETS)*, Madrid, Spain, September 2009.
  16. **N. H. Tran**, Tho Le-Ngoc, and Tad Matsumoto, “A simple near-capacity bandwidth-efficient coded modulation scheme in Rayleigh fading” in *Proc. IEEE Int. Conf. on Commun.*, Dresden, June 2009.
  15. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Application of Signal Space Diversity over Multiplicative Fading Channels” in *Proc. 24th Biennial Symposium on Commun.*, Queen’s University, Kingston, Canada, June 2008.

14. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “On Symbol and Bit Error Probabilities of Orthogonal Space-Time Block Codes with Antenna Selection over Keyhole Fading Channels” in *Proc. IEEE Int. Conf. on Commun.*, Beijing, China, May 2008.
13. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “BICM-ID with Signal Space Diversity for Keyhole Nakagami- $m$  Fading Channels” in *Proc. IEEE Int. Symposium on Inform. Theory (ISIT)*, Nice, France, June 2007.
12. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Application of Signal Space Diversity in BICM-ID over Cascaded Rayleigh Fading Channels”, in *Proc. IEEE Int. Conf. on Commun. (ICC)*, Glasgow, Scotland, UK, June 2007, pp. 4011–4016.
11. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Multi-dimensional Subcarrier Mapping for Bit-Interleaved Coded OFDM with Iterative Decoding”, in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC)*, Hong Kong, March 2007, pp. 1350–1355.
10. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Asymptotic Performance of Coded OFDM with Modulation Diversity and Iterative Decoding” in *Proc. 64th IEEE Veh. Tech. Conf. (VTC)*, Montreal, Canada, September 2006, pp. 1–5.
9. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Optimum Subcarrier Grouping and Rotation Matrix for Coded OFDM with Modulation Diversity” in *Proc. IEEE Int. Symposium on Inform. Theory (ISIT)*, Seattle, USA, July 2006, pp. 1384–1388.
8. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “On Subcarrier Grouping for OFDM with Linear Constellation Precoding”, in *Proc. 23rd Biennial Symposium on Commun.*, Queen’s University, Kingston, Canada, June 2006, pp. 204–208.
7. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Performance of BICM-ID with Signal Space Diversity” in *Proc. IEEE Int. Conf. on Commun. (ICC)*, Istanbul, Turkey, June 2006, pp. 1712–1717.
6. **N. H. Tran** and Ha H. Nguyen, “A Novel Multi-Dimensional Mapping of 8-PSK for BICM-ID” in *Proc. IEEE Int. Conf. on Commun. (ICC)*, Istanbul, Turkey, June 2006, pp. 5004–5009.
5. **N. H. Tran**, Ha H. Nguyen, and Tho Le-Ngoc, “Tight Error Bound for Coded Unitary Space-Time Modulation” in *Proc. IEEE Wireless Commun. and Networking Conf. (WCNC)*, Las Vegas, USA, April 2006, pp. 1893–1898.
4. **N. H. Tran** and Ha H. Nguyen, “On Multi-Dimensional Mappings of 8-QAM Constellation for BICM-ID Systems”, in *Proc. IEEE CCECE*, Saskatoon, Saskatchewan, Canada, May 2005, pp. 124–127.
3. **N. H. Tran** and Ha H. Nguyen, “Improving the Performance of BICM-ID Systems by Mapping on the Hypercube”, in *Proc. IEEE Veh. Tech. Conf. (VTC)*, Los Angeles, California, USA, September 2004, pp. 1299–1303.
2. **N. H. Tran** and Ha H. Nguyen, “Signal Mappings of 8-ary Constellations for BICM-ID Systems”, in *Proc. Wireless, 16th International Conference on Wireless Communications*, Calgary, Alberta, Canada, Jul. 2004, pp. 464–472.
1. **N. H. Tran** and Ha H. Nguyen, “Signal Mappings of 8-ary Constellations for BICM-ID Systems over a Rayleigh Fading Channel”, in *Proc. IEEE CCECE*, Niagara Falls, Ontario, Canada, May 2004, pp. 1809–1813.

## REFERENCES

### 1. **Dr. M. Cenk Gursoy**

Professor,

Department of Electrical Engineering & Computer Science, Syracuse University  
4-206 Center for Science and Technology, Syracuse, NY, 13244 USA

Phone: +1-315-443-4403, E-mail: mcgursoy@syr.edu

### 2. **Dr. Ashu Sabharwal**

Professor,

Department of Electrical & Computer Engineering, Rice University  
Duncan Hall 2018, Rice University, Houston, TX, 77251 USA

Phone: +1-713-348-5057, E-mail: ashu@rice.edu



**3. Dr. Tolga M. Duman**

Professor,

Department of Electrical and Electronics Engineering, Bilkent University

EE-406, TR-06800, Bilkent, Ankara, Turkey

Phone: +90-312-290-3394, E-mail: duman@ee.bilkent.edu.tr

**4. Dr. Ekram Hossain**

Professor,

Department of Electrical Engineering & Computer Science, University of Manitoba

75A Chancellor's Circle, Winnipeg, MB, R3T 5V6 Canada

Phone: +1-204-474-8908, E-mail: ekram.hossain@umanitoba.ca