

Nariman Farsad

CONTACT	Department of Computer Science Ryerson University	nfarsad@ryerson.ca http://narimanfarsad.com/
RESEARCH INTERESTS	My current research focuses on distributed deep learning and reinforcement learning, machine learning for sensing, and deep learning for video processing in virtual and augmented reality.	
CURRENT POSITION	Ryerson University, Toronto, Canada Assistant Professor of Computer Science Director of Machine Learning and Sensing Lab	07/2020–Present
PRIOR POSITIONS	Stanford University, Stanford, USA Visiting Research Scholar (Part-Time)	11/2018–07/2020
	Apple Inc., Cupertino, USA Senior Machine Learning and Algorithms Researcher	11/2018–07/2020
	Stanford University, Stanford, USA Postdoctoral Researcher	09/2015–11/2018
EDUCATION	York University, Toronto Ph.D., Computer Science	07/2015
	York University, Toronto M.Sc., Computer Science	06/2010
	York University, Toronto B.Sc. with honors, Computer Science	06/2007
SELECTED AWARDS	NSERC of Canada Postdoctoral Fellowship (\$90,000)	2015–2017
	Best Demo Award for “Molecular MIMO Communication Link” at IEEE-INFOCOM	2015
	Finalist in the Bell Labs Prize competition	2014
	Second Prize at IEEE ComSoc Student Competition	2014
	Ontario Graduate Scholarship Award (\$30,000)	2012–2014
	Queen Elizabeth II Graduate Scholarship in Science & Technology Award (\$15,000)	2011
GRANTS	NSERC, Discovery Grant	2020–2025
	Canada Foundation for Innovation (CFI), John R. Evans Leaders Fund	2020–2025
	NSERC, Launch Supplement	2020–2022
	Ryerson Faculty of Science Discovery Accelerator program	2020–2022
	Office of the Naval Research (ONR) grant N00014-18-1-2191	2018–2021
MEDIA COVERAGE	<ul style="list-style-type: none">• The Economist• Forbes• Stanford News• Chemistry World• IEEE Spectrum• The Wall Street Journal• CTV News• Gizmodo• Discovery Channel• PHYS.ORG• Engadget• Globe and Mail• National Post• Wired• Science & Vie	

SUPERVISORY EXPERIENCE	Mr. Vahid Jamali	Summer and Fall 2017
	Co-supervising a visiting PhD student from University of Erlangen-Nuremberg, Germany	
	Mr. Bonhong Koo	Summer and Fall 2017
	Co-supervising a visiting PhD student from Yonsei University, South Korea	
	Mr. Jonathan Griffin	Spring 2017
	Co-supervised an undergraduate research course project	
	Mr. David Pan	Summer 2016
	Co-supervised summer undergrad research project	
	Mr. Liam Hassen Neath	Spring 2016
	Co-supervised an undergraduate research course project	
	Miss Lida Jabbari	2014–2015
Co-supervised M.A.Sc. project		
Mr. LinChen Wang	2013–2014	
Co-supervised M.A.Sc. project		
Miss Na-Rea Kim	Summer 2013	
Visiting PhD Student from Yonsei University, South Korea		
Mr. Anthony Calce	2010–2011	
Co-supervised M.A.Sc. project		
PROFESSIONAL SERVICE	Guest Editor	
	Journal Entropy–Initiated a Special Issue on the “Role of Signal processing and Information Theory in Modern Machine Learning”, 2020.	
	Co-Chair	
	IEEE Communication Theory Workshop–Co-Chair for the Machine Learning Data Competition at the conference, 2020.	
	Area Associate Editor	
	IEEE Journal on Selected Areas in Communication–Special Issue on Emerging Technologies in Communications, 2013.	
	Technical Program Committee	
	IEEE International Conference on Communication (ICC), 2015, 2018, 2019, 2021	
	IEEE Global Communications Conference (GLOBECOM), 2015, 2016, 2017, 2018, 2019, 2020	
	International Conference on Bio-inspired Information and Communications Technologies (BICT), 2015, 2016	
	Standardization Project	
P1906.1 - Recommended Practice for Nanoscale and Molecular Communication Framework		
Technical Reviewer		
IEEE Transactions on Signal Processing		
IEEE Transactions on Information Theory		
IEEE Transactions on Nanotechnology		
IEEE Transactions on Biomedical Engineering		
IEEE Transactions on NanoBioscience		
IEEE Journal on Selected Areas in Communication		
IEEE Transactions on Communication		
IEEE Wireless Communications Letters		
IEEE International Symposium on Information Theory (ISIT)		
JOURNAL PUBLICATIONS	[J26] N. Farsad , N. Shlezinger, A. Goldsmith, and Y. Eldar, “Data-Driven Symbol Detection via Model-Based Machine Learning,” <i>Communications in Information and Systems</i> , submitted, 2020.	

- [J25] N. Shlezinger, **N. Farsad**, Y. Eldar, and A. Goldsmith, “ViterbiNet: A Deep Learning Based Viterbi Algorithm for Symbol Detection,” *IEEE Transactions on Wireless Communications*, 2019.
- [J24] V. Jamali, **N. Farsad**, R. Schober, and A. Goldsmith, “Diffusive Molecular Communications with Reactive Molecules: Channel Modeling and Signal Design,” *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, 2018.
- [J23] **N. Farsad**, Y. Murin, A. W. Eckford, and A. Goldsmith, “Capacity Limits of Diffusion-Based Molecular Timing Channels,” *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, 2018.
- [J22] Y. Murin, **N. Farsad**, M. Chowdhury, and A. Goldsmith, “Optimal Detection for One-Shot Transmission over Diffusion-Based Molecular Timing Channels,” *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, 2018.
- [J21] **N. Farsad**, and A. Goldsmith, “Neural Network Detection of Data Sequences in Communication Systems,” *IEEE Transactions on Signal Processing*, vol. 66, no. 21, pp. 5663–5678, 2018.
- [J20] **N. Farsad**, Y. Murin, W. Guo, C.-B. Chae, A. Eckford and A. Goldsmith, “Communication System Design and Analysis for Asynchronous Molecular Timing Channels,” *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, accepted, 2018.
- [J19] N.-R. Kim, **N. Farsad**, A. Eckford, C.-B. Chae, “An Experimentally Validated Channel Model for Molecular Communication Systems”, *IEEE Access*, accepted, 2018.
- [J18] Y. Murin, **N. Farsad**, M. Chowdhury, and A. Goldsmith, “Exploiting Diversity in Molecular Timing Channels via Order Statistics,” *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*, accepted, 2018.
- [J17] **N. Farsad**, “Molecular Communication: Interconnecting Tiny NanoBio Devices,” *GetMobile: Mobile Comp. and Comm.*, vol. 22, no. 2, pp. 5–10, 2018.
- [J16] V. Jamali, A. Ahmadzadeh, **N. Farsad**, and R. Schober, “Constant-Composition Codes for Maximum Likelihood Detection without CSI in Diffusive Molecular Communications,” *IEEE Transactions on Communications*, vol. 66, no. 5, pp. 1981–1995 2018.
- [J15] V. Jamali, **N. Farsad**, R. Schober, and A. Goldsmith, “Non-Coherent Detection for Diffusive Molecular Communications,” *IEEE Transactions on Communications*, vol. 66, no. 6, pp. 2515–2531, 2018.
- [J14] W. Guo, Y. Deng, B. H. Yilmaz, **N. Farsad**, M. El Kashlan, C.-B. Chae, A. Eckford, and A. Nallanathan, “SMIET: Simultaneous Molecular Information and Energy Transfer,” *IEEE Wireless Communications*, vol. 25, no. 1, pp. 106–113, 2018.
- [J13] Y. Murin, **N. Farsad**, M. Chowdhury, and A. Goldsmith, “Time-Slotted Transmission over Molecular Timing Channels,” *Elsevier Nano Communication Networks*, vol. 12, pp. 12–24, 2017.
- [J12] **N. Farsad**, B. H. Yilmaz, A. W. Eckford, C.-B. Chae, and W. Guo, “A Comprehensive Survey of Recent Advancements in Molecular Communication,” *IEEE Communications Surveys & Tutorials*, vol. 18, no. 3, pp. 1887–1919, 2016.
- [J11] B. Koo, C. Lee, H. B. Yilmaz, **N. Farsad**, A. W. Eckford, and C.-B. Chae “Molecular MIMO: From Theory to Prototype,” *IEEE Journal on Selected Areas in Communications*, vol. 34, no. 3, pp. 600–614, 2016.
- [J10] W. Guo, T. Asyhari, **N. Farsad**, B. H. Yilmaz, A. W. Eckford, and C.-B. Chae, “Molecular Communications: Channel Model and Physical Layer Techniques,” *IEEE Wireless Communications*, vol. 23, no. 4, pp. 120–127, 2016.
- [J9] W. Guo, C. Mias, **N. Farsad**, and J.-L. Wu, “Molecular Versus Electromagnetic Wave Propagation Loss in Macro-Scale Environments,” *IEEE Transactions on Molecular, Biological, and Multi-Scale Communications*, vol. 1, no. 1, pp. 18–25, 2015.

- [J8] **N. Farsad**, A. W. Eckford, and S. Hiyama, “Design and Optimizing of On-Chip Kinesin Substrates for Molecular Communication,” *IEEE Transactions on Nanotechnology*, vol. 14, no. 4, pp. 699–708, 2015.
- [J7] **N. Farsad**, N.-R. Kim, A. W. Eckford, and C.-B. Chae, “Channel and Noise Models for Nonlinear Molecular Communication Systems,” *IEEE Journal on Selected Areas in Communications*, vol. 32, no. 12, pp. 2392–2401, 2014.
- [J6] **N. Farsad**, A. W. Eckford, and S. Hiyama, “A Markov Chain Channel Model for Active Transport Molecular Communication,” *IEEE Transactions on Signal Processing*, vol. 62, no. 9, pp. 2424–2436, 2014.
- [J5] S. Qiu, W. Guo, M. Leeson, S. Wang, **N. Farsad**, and A. W. Eckford, “Nanoparticle Communications: from Chemical Signals in Nature to Wireless Sensor Networks,” *Nanotechnology Perceptions*, vol. 10, no. 1, pp. 1–13, 2014.
- [J4] **N. Farsad**, W. Guo, and A. W. Eckford, “Tabletop Molecular Communication: Text Messages Through Chemical Signals,” *PLOS ONE*, vol. 8, no. 12, 2013.
- [J3] **N. Farsad**, A. W. Eckford, S. Hiyama, and Y. Moritani, “On-Chip Molecular Communication: Analysis and Design,” *IEEE Transactions on NanoBioscience*, vol. 11, no. 3, pp. 304–314, 2012.
- [J2] **N. Farsad**, and A. W. Eckford, “Resource Allocation via Linear Programming for Fractional Cooperation,” *IEEE Transactions on Wireless Communications*, vol. 11, no. 5, pp. 1633–1637, 2012.
- [J1] **N. Farsad**, A. W. Eckford, S. Hiyama, and Y. Moritani, “Quick System Design of Vesicle-Based Active Transport Molecular Communication by Using a Simple Transport Model,” *Nano Communication Networks*, vol. 2, no. 4, pp. 175–188, 2011.

CONFERENCE
PAPERS

- [C41] N. Shlezinger, **N. Farsad**, Y. C. Eldar, and A. Goldsmith, “Data-Driven Factor Graphs for Deep Symbol Detection,” *IEEE International Symposium on Information Theory (ISIT)*, 2020.
- [C40] Y. Liao, **N. Farsad**, N. Shlezinger, Y. C. Eldar, and A. Goldsmith, “Deep Neural Network Symbol Detection for Millimeter Wave Communications,” *IEEE Global Communications Conference (GLOBECOM)*, 2019.
- [C39] N. Shlezinger, **N. Farsad**, Y. C. Eldar, and A. Goldsmith, “ViterbiNet: Symbol Detection Using a Deep Learning Based Viterbi Algorithm,” *IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2019.
- [C38] **N. Farsad**, and A. Goldsmith, “Detection Over Rapidly Changing Communication Channels Using Deep Learning,” *Asilomar Conference on Signals, Systems, and Computers*, 2018.
- [C37] **N. Farsad**, and A. Goldsmith, “Neural Network Detectors for Molecular Communication Systems,” *IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2018.
- [C36] M. Rao, **N. Farsad**, and A. Goldsmith, “Variable Length Joint Source-Channel Coding of Text Using Deep Neural Networks,” *IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, 2018.
- [C35] **N. Farsad**, and A. Goldsmith, “Sliding Bidirectional Recurrent Neural Networks for Sequence Detection in Communication Systems,” *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018.
- [C34] **N. Farsad**, M. Rao, and A. Goldsmith, “Deep Learning for Joint Source-Channel Coding of Text,” *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, 2018.
- [C33] J. W. Kwack, H. B. Yilmaz, **N. Farsad**, C.-B. Chae, and A. Goldsmith, “Two Way Molecular Communications,” *ACM International Conference on Nanoscale Computing and Communication (NANOCOM)*, 2018.

- [C32] V. Jamali, **N. Farsad**, R. Schober, and A. Goldsmith, “Diffusive Molecular Communications with Reactive Signaling,” *IEEE International Conference on Communications (ICC)*, 2018.
- [C31] **N. Farsad**, D. Pan, and A. Goldsmith, “A Novel Experimental Platform for In-Vessel Multi-Chemical Molecular Communications,” *IEEE Global Communications Conference (GLOBECOM)*, 2017.
- [C30] Y. Murin, M. Chowdhury, **N. Farsad**, and A. Goldsmith, “Diversity Gain of One-shot Communication over Molecular Timing Channels,” *IEEE Global Communications Conference (GLOBECOM)*, 2017.
- [C29] C. Lee, H. B. Yilmaz, C.-B. Chae, **N. Farsad**, and A. Goldsmith, “Machine Learning based Channel Modeling for Molecular MIMO Communications,” *IEEE International workshop on Signal Processing advances in Wireless Communications (SPAWC)*, 2017.
- [C28] **N. Farsad**, C. Rose, M. Medard, and A. Goldsmith, “Capacity of Molecular Channels with Imperfect Particle-Intensity Modulation and Detection,” *IEEE International Symposium on Information Theory (ISIT)*, 2017.
- [C27] V. Jamali, A. Ahmadzadeh, **N. Farsad**, and R. Schober, “SCW Codes for Optimal CSI-Free Detection in Diffusive Molecular Communications,” *IEEE International Symposium on Information Theory (ISIT)*, 2017.
- [C26] **N. Farsad**, Y. Murin, M. Rao, and A. Goldsmith, “On the Capacity of Diffusion-Based Molecular Timing Channels with Diversity,” *Asilomar Conference on Signals, Systems, and Computers*, 2016.
- [C25] **N. Farsad**, Y. Murin, W. Guo, C.-B. Chae, A. Eckford and A. Goldsmith, “On the Impact of Time-Synchronization in Molecular Timing Channels,” *IEEE Global Communications Conference (GLOBECOM)*, 2016.
- [C24] Y. Murin, **N. Farsad**, M. Chowdhury, and A. Goldsmith, “Communication over Diffusion-Based Molecular Timing Channels,” *IEEE Global Communications Conference (GLOBECOM)*, 2016.
- [C23] V. Jamali, **N. Farsad**, R. Schober, and A. Goldsmith, “Non-Coherent Multiple-Symbol Detection for Diffusive Molecular Communications,” *ACM International Conference on Nanoscale Computing and Communication (NanoCom)*, 2016.
- [C22] Y. Murin, **N. Farsad**, M. Chowdhury, and A. Goldsmith, “On Time-Slotted Communication over Molecular Timing Channels,” *ACM International Conference on Nanoscale Computing and Communication (NanoCom)*, 2016.
- [C21] **N. Farsad**, Y. Murin, A. W. Eckford, and A. Goldsmith, “On the Capacity of Diffusion-Based Molecular Timing Channels,” *IEEE International Symposium on Information Theory (ISIT)*, 2016.
- [C20] **N. Farsad**, and Andrea Goldsmith, “A Molecular Communication System Using Acids, Bases and Hydrogen Ions,” *IEEE International workshop on Signal Processing advances in Wireless Communications (SPAWC)*, 2016.
- [C19] **N. Farsad**, H. B. Yilmaz, C.-B. Chae, and Andrea Goldsmith, “Energy Model for Vesicle-Based Active Transport Molecular Communication,” *IEEE International Conference on Communications (ICC)*, 2016.
- [C18] **N. Farsad**, W. Guo, C.-B. Chae, and A. W. Eckford, “Stable Distributions as Noise Models for Molecular Communication,” *IEEE Global Communication Conference (GLOBECOM)*, 2015.
- [C17] C. Lee, B. Koo, N.-R. Kim, H. B. Yilmaz, **N. Farsad**, A. W. Eckford, and C.-B. Chae, “Molecular MIMO with Drift,” *International Conference on Mobile Computing and Networking (MobiCom)*, 2015.
- [C16] S. Qiu, **N. Farsad**, Y. Dong, A. W. Eckford, and W. Guo, “Under-Water Molecular Signalling: a Hidden Transmitter and Absent Receivers Problem,” *IEEE International Conference on Communications (ICC)*, 2015.

- [C15] N.-R. Kim, **N. Farsad**, C.-B. Chae, and A. W. Eckford, "A Universal Channel Model for Molecular Communication Systems with Metal-Oxide Detectors," *IEEE International Conference on Communications (ICC)*, 2015.
- [C14] L. Wang, **N. Farsad**, W. Guo, S. Magierowski, and A. W. Eckford, "Molecular Barcodes: Information Transmission via Persistent Chemical Tags," *IEEE International Conference on Communications (ICC)*, 2015.
- [C13] C. Lee, B. Koo, N.-R. Kim, H. B. Yilmaz, **N. Farsad**, A. W. Eckford, and C.-B. Chae, "Molecular MIMO Communication Link," *IEEE International Conference on Computer Communications (INFOCOM)*, 2015.
- [C12] N.-R. Kim, **N. Farsad**, C.-B. Chae, and A. W. Eckford, "A Realistic Channel Model for Molecular Communication with Imperfect Receivers," *IEEE International Conference on Communications (ICC)*, 2014.
- [C11] S. Qiu, W. Guo, S. Wang, **N. Farsad**, and A. W. Eckford, "A Molecular Communication Link for Monitoring in Confined Environments," *IEEE International Conference on Communications (ICC) Workshops*, 2014.
- [C10] **N. Farsad**, W. Guo, and A. W. Eckford, "Molecular Communication Link," *IEEE International Conference on Computer Communications (INFOCOM)*, 2014.
- [C9] **N. Farsad**, A. W. Eckford, and S. Hiyama, "Modelling and Design of Polygon-Shaped Kinesin Substrates for Molecular Communication," *IEEE International Conference on Nanotechnology*, 2012.
- [C8] **N. Farsad**, A. W. Eckford, and S. Hiyama, "A Mathematical Channel Optimization Formula for Active Transport Molecular Communication," *IEEE International Conference on Communications (ICC) Workshops*, 2012.
- [C7] **N. Farsad**, A. Eckford, and S. Hiyama, "Channel design and optimization of active transport molecular communication," *Bio-Inspired Models of Networks, Information, and Computing Systems (BIONETICS)*, 2011.
- [C6] A. Calce, **N. Farsad**, and A. W. Eckford, "An Experimental Study of Fractional Cooperation in Wireless Mesh Networks," *IEEE Symposium on Personal Indoor Mobile Radio Communications (PIMRC)*, 2011.
- [C5] **N. Farsad**, A. Eckford, S. Hiyama, and Y. Moritani, "Information rates of active propagation in microchannel molecular communication," in *Bio-Inspired Models of Networks, Information, and Computing Systems (BIONETICS)*, 2010.
- [C4] **N. Farsad**, A. W. Eckford, S. Hiyama, and Y. Moritani, "A Simple Mathematical Model for Information Rate of Active Transport Molecular Communication," *IEEE International Conference on Computer Communications (INFOCOM) Workshops*, 2011.
- [C3] A. W. Eckford, **N. Farsad**, S. Hiyama, and Y. Moritani, "Microchannel Molecular Communication with Nanoscale Carriers: Brownian Motion versus Active Transport," *IEEE International Conference on Nanotechnology*, 2010.
- [C2] **N. Farsad**, and A. W. Eckford, "Resource allocation via linear programming for multi-source, multi-relay wireless networks," *IEEE International Conference on Communications (ICC)*, 2010.
- [C1] **N. Farsad**, and A. W. Eckford, "Low-complexity cooperation with correlated sources: diversity order analysis," *Annual Conference on Information Sciences and Systems (CISS)*, 2009.
- [P1] **N. Farsad**, and Andrea Goldsmith, "Systems and methods for transmitting data using machine learning classification," US Patent number 15/896,982, submitted 02/18.

-
- [19] **N. Farsad**, “Data-Driven Factor Graphs: Deep Learning on Small Data Sets,” *Information Theory and Applications (ITA) Workshop*, San Diego, CA, USA. (February 2020)
 - [18] **N. Farsad** “Detection Over Rapidly Changing Communication Channels Using Deep Learning,” *Asilomar Conference on Signals, Systems and Computers*, (October 2018).
 - [17] **N. Farsad**, “What role can machine learning play in communication system design?,” *Invited by the Montreal Chapter of the IEEE Signal Processing Society*, Montreal, Canada. (May 2018)
 - [16] **N. Farsad**, “What role can machine learning play in communication system design?,” *Information Theory and Applications (ITA) Workshop*, San Diego, CA, USA. (February 2018)
 - [15] **N. Farsad**, “Detection Over Unknown Channels via Machine Learning,” *International Zurich Seminar on Information and Communication*, Zurich, Switzerland. (February 2018)
 - [14] **N. Farsad**, “Information Theoretic Limits of Molecular Communication and System Design Using Machine Learning,” *IEEE Information Theory Society’s Santa Clara Valley Chapter*, Stanford University. (October 2017)
 - [13] **N. Farsad**, and C. Rose, “Molecular Communication: System Models, Fundamental Limits, and Experimental Implementations,” *IEEE Wireless Communications and Networking Conference, a conference tutorial*, San Francisco, CA, USA. (March 2017)
 - [12] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, Department of Electrical and Computer Engineering, **University of British Columbia**, Vancouver, British Columbia. (June 2016)
 - [11] **N. Farsad**, “Capacity Limits of Diffusion-Based Molecular Timing Channels”, **Canadian Biennial Symposium on Communications (BSC)**, Kelowna, British Columbia. (June 2016)
 - [10] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, School of Electrical and Computer Engineering, **Georgia Institute of Technology**, Atlanta, Georgia. (May 2016)
 - [9] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, Department of Electrical and Computer Engineering, **Carnegie Mellon University**, Pittsburgh, Pennsylvania. (May 2016)
 - [8] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, Department of Electrical and Computer Engineering, **Boston University**, Cambridge, Massachusetts. (May 2016)
 - [7] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, Department of Electrical Engineering and Computer Science, **Massachusetts Institute of Technology**, Cambridge, Massachusetts. (May 2016)
 - [6] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, **IEEE Toronto Section and University of Toronto**, Toronto, Ontario. (April 2016)
 - [5] **N. Farsad**, “Molecular Communication: Theoretical Limits and Experimental Implementations”, Department of Electrical Engineering, **Princeton University**, Princeton, New Jersey. (April 2016)
 - [4] **N. Farsad**, “Capacity Limits of Molecular Timing Channels”, **Information Theory and Applications (ITA) Workshop**, San Diego, California. (Feb 2016)
 - [3] **N. Farsad**, “Molecular Communication using Acids and Bases”, Communications, Inference, And Computing In Molecular And Biological Systems Workshop, **University of Southern California**, USA. (December 2015)
 - [2] **N. Farsad**, “Tabletop Molecular Communication: Theory and Practice”, School of Engineering, **University of Warwick**, United Kingdom. (September 2014)
 - [1] **N. Farsad**, “Molecular Communication”, School of Integrated Technology, **Yonsei University**, South Korea. (November 2013)

TEACHING
EXPERIENCE

Current Teaching, Ryerson University, Toronto, Canada

Machine Learning

Fall 2020

Reinforcement Learning

Winter 2021

Prior Teaching, University of Ontario Institute of Technology, Greater Toronto Area

Advanced Communication Networks

Winter 2015

Signals and Random Processes

Fall 2012

Signals and Random Processes

Fall 2011

MEMBERSHIPS

Engineering Intern at Professional Engineers Ontario, since 2011

IEEE Member, since 2007

IEEE Communication Society Member, since 2007

IEEE Information Theory Society Member, since 2007

IEEE Signal Processing Society Member, since 2009