

Curriculum Vitae

Christopher G. Brinton, PhD

CONTACT INFORMATION

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PROFESSIONAL EXPERIENCE

Purdue University, West Lafayette, IN

Assistant Professor of Electrical and Computer Engineering

Aug 2019 – Present

- *Research:* My research is at the intersection of machine learning and network optimization. I am advising/co-advising 7 PhD students and one postdoc in this area. I received a *2019 Purdue Seed for Success Award* in my first semester, and the *2020 Purdue ECE Outstanding Faculty Mentor Award* in my second semester.
- *Teaching:* I co-developed a new undergraduate-level course *Python for Data Science* that is now a requirement for ECE majors. I received the *2020 Ruth and Joel Spira Outstanding Teaching Award* after my first year.
- *Service:* I have served on several internal and external committees, including the Purdue ECE Foundations of Data Science Faculty Search Committee (2019-2020), the Purdue ECE Graduate Committee (2019-present), the Purdue ECE CNSIP Admissions Committee (2019-present), and the annual INFOCOM Program Committee (2018-present).

Princeton University, Princeton, NJ

Associate Director of the EDGE Lab

Sept 2018 – Jul 2019

Lecturer of Electrical Engineering

Sept 2017 – Jun 2019

- The Princeton EDGE Lab is devoted to research, education, and innovation in edge computing, edge networking, and data science. It has graduated over 30 PhD students and postdocs.
- I taught 3-4 courses each year, including *Networks: Friends, Money, and Bytes* which covers data science, optimization, and algorithms for social, technological, and economic networks.

Zoomi Inc., Chesterbrook, PA (www.zoomi.ai)

Principal Data Scientist

Aug 2019 – Present

Head of Advanced Research

Jun 2016 – Jul 2019

Consulting Head of Research

Feb 2014 – May 2016

Co-founder

Jun 2013 – Present

Research Intern

Jun 2013 – Aug 2013

- Zoomi is a big data startup company that provides predictive analytics and individualized learning for employee performance optimization. The service has been deployed to over one million users at Fortune 500 companies.
- I co-founded Zoomi based on my research pertaining to Social Learning Networks (SLN), and have led a team of 7 full-time, four part-time, and 9 summer intern data science researchers.

The College of New Jersey, Ewing, NJ

Adjunct Professor of Engineering

Aug 2016 – May 2017

EDUCATION

Princeton University, Princeton, NJ

Doctor of Philosophy in Electrical Engineering

May 2016

- Research on data science and networking resulted in several papers, invited talks, and a startup company. PhD thesis won the *2016 Bede Liu Best Dissertation Award in Electrical Engineering*.
- First author of textbook *The Power of Networks: Six Principles That Connect Our Lives*, which was profiled in several media such as TIME and is being used to teach courses around the world.
- Co-instructor of three online courses to over 400,000 students, and lead TA of an in-class course.

Masters Degree in Electrical Engineering

May 2013

- Thesis on optimization methods for power systems and communication networks

The College of New Jersey, Ewing, NJ

Bachelor of Science in Electrical Engineering

May 2011

- Graduated valedictorian and summa cum laude

PUBLICATIONS

Books

- B2. C. Brinton, M. Chiang. *The Power of Networks: Six Principles that Connect our Lives*. Princeton University Press, 2016. www.powerofnetworks.org.
- B1. C. Brinton, M. Chiang. *Networks Illustrated: 8 Principles Without Calculus*. EdWiser Scholastic Press, 2013.

Journal Papers

- J14. M. Lee, S. Hosseinalipour, C. Brinton, G. Yu, H. Dai. A Fast Graph Neural Network-Based Method for Winner Determination in Multi-Unit Combinatorial Auctions. *IEEE Transactions on Cloud Computing*, 2021.
- J13. T. Doleck, D. Lemay, C. Brinton. Evaluating the Efficiency of Social Learning Networks: Perspectives for Harnessing Learning Analytics to Improve Discussions. *Computers & Education*, 2021.
- J12. H. Nguyen, V. Schwag, S. Hosseinalipour, C. Brinton, M. Chiang, H. V. Poor. Fast-Convergent Federated Learning. *IEEE Journal on Selected Areas in Communications*, Vol. 39, No. 1, p. 201-218, 2021.
- J11. S. Hosseinalipour, C. Brinton, V. Aggarwal, H. Dai, M. Chiang. From Federated Learning to Fog Learning: Towards Large-Scale Distributed Machine Learning in Heterogeneous Networks. *IEEE Communications Magazine*, Vol. 58, No. 12, p. 41-47, 2020.
- J10. S. Liu, C. Joe-Wong, J. Chen, C. Brinton, C. Tan, L. Zheng. Economic Viability of a Virtual ISP. *IEEE/ACM Transactions on Networking*, Vol. 28, No. 2, p. 902-916, 2020.
- J9. W. Chen, C. Brinton, D. Cao, M. Chiang. Early Detection Prediction of Learning Outcomes in Online Short-Courses via Learning Behaviors. *IEEE Transactions on Learning Technologies*, Vol. 12, No. 1, 2019.
- J8. C. Brinton, S. Buccapatnam, L. Zheng, D. Cao, A. Lan, F. Wong, S. Ha, M. Chiang, H. V. Poor. On the Efficiency of Online Social Learning Networks. *IEEE/ACM Transactions on Networking*, Vol. 26, No. 5, p. 2076-2089, 2018.
- J7. T. Yang, C. Brinton, C. Joe-Wong, M. Chiang. Behavior-Based Grade Prediction for MOOCs via Time Series Neural Networks. *IEEE Journal of Selected Topics in Signal Processing*, Vol. 11, No. 5, p. 716-728, 2017.
- J6. C. Brinton, S. Buccapatnam, M. Chiang, H. V. Poor. Mining MOOC Clickstreams: Video-Watching Behavior versus In-Video Quiz Performance. *IEEE Transactions on Signal Processing*, Vol. 64, No. 14, p. 3677-3692, 2016.
- J5. C. Brinton, R. Rill, S. Ha, M. Chiang, R. Smith, W. Ju. Individualization for Education at Scale: MIIC Design and Preliminary Evaluation. *IEEE Transactions on Learning Technologies*, Vol. 8, No. 1, p. 136-148, 2015.
- J4. C. Brinton, M. Chiang, S. Jain, H. Lam, Z. Liu, F. Wong. Learning about social learning in MOOCs: From statistical analysis to generative model. *IEEE Transactions on Learning Technologies*, Vol. 7, No. 4, p. 346-359, 2014.

- J3. K. Reichmann, P. Iannone, C. Brinton, et al. A Symmetric-Rate, Extended-Reach 40Gb/s CWDM-TDM PON with Downstream and Upstream SOA-Raman Amplification. *IEEE Journal of Lightwave Technology*, Vol. 30, No. 4, p. 479-485, 2012.
- J2. C. Brinton, M. Wharton, A. Katz. Design and Demonstration of a Passive, Broadband Equalizer for an SLED. *IEEE Microwave Journal*, 2012.
- J1. C. Brinton, D. Hirsh. Sensitivity Enhancement in Continuous-Wave Electron Paramagnetic Resonance: Adaptive Signal Averaging versus a Moving Average. *Review of Scientific Instruments*, Vol. 81, No. 2, 2010.

Conference Papers

- C32. R. Sahay, C. Brinton, D. Love. Frequency-based Automated Modulation Classification in the Presence of Adversaries. *IEEE ICC*, 2021.
- C31. M. Oh, S. Hosseinalipour, T. Kim, C. Brinton, D. Love. Channel Estimation via Successive Denoising in MIMO OFDM Systems: A Reinforcement Learning Approach. *IEEE International Conference on Communications (ICC)*, 2021.
- C30. S. Wang, M. Lee, S. Hosseinalipour, R. Morabito, M. Chiang, C. Brinton. Device Sampling for Heterogeneous Federated Learning: Theory, Algorithms, and Implementation. *IEEE INFOCOM*, 2021.
- C29. F. Lin, C. Brinton, N. Michelusi. Federated Learning with Communication Delay in Edge Networks. To appear, *IEEE Global Communications Conference (Globecom)*, 2020.
- C28. Y. Tu, Y. Ruan, S. Wagle, C. Brinton, C. Joe-Wong. Network-Aware Optimization of Distributed Learning for Fog Computing. *IEEE INFOCOM*, 2020.
- C27. J. Kim, T. Kim, M. Hashemi, C. Brinton, D. Love. Joint Optimization of Signal Design and Resource Allocation in Wireless D2D Edge Computing. *IEEE INFOCOM*, 2020.
- C26. S. Mitra, S. Bari, T. M. Talavage, C. Brinton. Generative Adversarial Networks to Model Scanner Noise for Improving Multi-Site Data Harmonization. *Organization for Human Brain Mapping*, 2020.
- C25. Y. Tu, E. Tenorio, C. Brinton. An Adaptive Content Skipping Methodology based on User Behavioral Modeling. *IEEE CISS*, 2020.
- C24. P. Hansen, R. Bustamante, T. Yang, E. Tenorio, C. Brinton, M. Chiang, A. Lan. Predicting the Timing and Quality of Responses in Online Discussion Forums. *IEEE International Conference on Distributed Computing Systems (ICDCS)*, 2019.
- C23. Y. Tu, C. Brinton, A. Lan, M. Chiang. Adaptive Remediation with Multi-modal Content. *International Conference on Human Computer Interaction (HCI)*, 2019.
- C22. Y. Tu, W. Chen, C. Brinton. A Deep Learning Approach to Behavior-Based Learner Modeling. *EDM*, 2019.
- C21. T. Yang, C. Brinton, P. Mittal, M. Chiang, A. Lan. Learning Informative and Private Representations via Generative Adversarial Networks. *IEEE International Conference on Big Data*, 2018.
- C20. A. Lan, C. Brinton, J. Spencer, Z. Chen, M. Chiang. A Probabilistic Model for MOOC Discussion Forums. *European Conference on Machine Learning and Principles and Practice of Knowledge Discovery in Databases (ECML-PKDD)*, 2018.
- C19. Y. Tu, Y. Xiong, W. Chen, C. Brinton. A Domain-Independent Text Segmentation Method for Educational Course Content. *IEEE International Conference on Big Data Workshop on Data Mining for eLearning Personalization*, 2018.
- C18. W. Chen, C. Joe-Wong, C. Brinton, L. Zheng, D. Cao. Principles for Assessing Adaptive Online Courses. *EDM*, 2018.
- C17. W. Chen, A. Lan, D. Cao, C. Brinton, M. Chiang. Behavioral Analysis at Scale: Learning Course Prerequisite Structures from Learner Clickstreams. *EDM*, 2018.

- C16. D. Cao, A. Lan, W. Chen, C. Brinton, and M. Chiang. Learner Behavioral Feature Refinement and Augmentation using GANs, *International Conference on Artificial Intelligence in Education (AIED)*, 2018.
- C15. M. Shridharan, A. Willingham, J. Spencer, T. Yang, C. Brinton. Predictive Learning Analytics for Video-Watching Behavior in MOOCs. *IEEE CISS*, 2018.
- C14. C. Bridges, J. Jared, J. Weissmann, A. Montanez-Garay, J. Spencer, C. Brinton. Course Recommendation as Graphical Analysis. *IEEE CISS*, 2018.
- C13. N. Slighton, J. Rico, E. Kallfelz, J. Qi, C. Brinton. A Network-Driven Approach to Modeling the Spread of Ebola-type Epidemics. *IEEE CISS*, 2018.
- C12. T. Yang, C. Brinton, C. Joe-Wong. Predicting Learner Interactions in Social Learning Networks. *IEEE INFOCOM*, 2018.
- C11. A. Lan, C. Brinton, T. Yang, M. Chiang. Behavior-Based Latent Variable Model for Learner Engagement. *International Conference on Educational Data Mining (EDM)*, 2017.
- C10. W. Chen, C. Brinton, D. Cao, M. Chiang. Behavior in Social Learning Networks: Early Detection for Online Short-Courses. *IEEE INFOCOM*, 2017.
- C9. L. Zheng, C. Joe-Wong, J. Chen, C. Brinton, C. Tan, M. Chiang. Economic Viability of a Virtual ISP. *IEEE INFOCOM*, 2017.
- C8. C. Brinton, S. Buccapatnam, F. Wong, M. Chiang, H. V. Poor. Social Learning Networks: Efficiency Optimization in MOOC Forums. *IEEE INFOCOM*, 2016.
- C7. L. Zheng, C. Joe-Wong, C. Brinton, C. Tan, S. Ha, M. Chiang. On the Viability of a Cloud Virtual Service Provider. *ACM SIGMETRICS*, 2016.
- C6. C. Brinton, M. Chiang. MOOC Performance Prediction via Clickstream Data and Social Learning Networks. *IEEE International Conference on Computer Communications (INFOCOM)*, 2015.
- C5. C. Brinton, M. Chiang. Social Learning Networks: A Brief Survey. *48 Annual Conference on Information Science and Systems (CISS)*, 2014.
- C4. C. Brinton, E. Aryafar, S. Corda, S. Russo, R. Renoso, M. Chiang. An Intelligent Satellite Multicast and Caching Overlay for CDNs to Improve Performance in Video Applications. *31st AIAA International Communications Satellite Systems Conference (ICSSC)*, 2013.
- C3. P. Iannone, K. Reichmann, C. Brinton, et al. Experimental Demonstration of a Cost-Effective Broadcast Overlay for a Commercial WDM PON. *National Fiber Optic Engineers Conference (NFOEC)*, 2011.
- C2. P. Iannone, K. Reichmann, C. Brinton, et al. Bi-Directionally Amplified Extended Reach 40Gb/s CWDM-TDM PON with Burst-Mode Upstream Transmission. *Optical Fiber Communication Conference (OFC)*, 2011.
- C1. A. Katz, D. Magee, C. Brinton, and J. Qiu. Sensitivity and Mitigation of Reverse IMD in High Power Amplifiers. *2011 IEEE Topical Conference on Power Amplifiers for Wireless and Radio Applications (PAWR)*, 2011.

Whitepapers

- W4. C. Brinton, D. Love, T. Kim, M. Hashemi, A. Christianson, R. Raj. Network-Aware Distributed Machine Learning and Sensor Fusion for Spectrum System Intelligence. Sept 2020.
- W3. D. Ogbe, D. Love, C. Wang, C. Brinton. Low-Latency Techniques to Support New Scientific Missions for Beyond-5G Wireless Networks. Jan 2020.
- W2. C. Brinton, D. Love, A. Marcum, S. Mau. Distributed AI and Reception for 5G-and-Beyond Spectrum Learning. Jun 2019.
- W1. M. Chiang, C. Brinton. Individualization for Effective Learning at Massive Scale. Jul 2014.

Journals Under Review / Under Revision

- R7. S. Wang, Y. Tu, Y. Ruan, S. Wagle, C. Brinton, C. Joe-Wong. Network-Aware Optimization of Distributed Learning for Fog Computing. Under revision (since Sept. 2020), *IEEE/ACM Transactions on Networking*.
- R6. S. Wang, Y. Tu, Q. Wu, A. Hare, Z. Liu, C. Brinton, Y. Li. A Spectral Biclustering Approach to Single Document Topic Modeling and Segmentation. Under revision (since Oct. 2020), *ACM Transactions on Intelligent Systems and Technology*.
- R5. R. Sahay, C. Brinton. Learning Intrinsic Properties of P300 Waveforms For Inter-Subject Generalization. Under revision (since Dec. 2020), *IEEE Access*.
- R4. C. Chen, C. Brinton, V. Aggarwal. Latency Minimization for Cache-Enabled Mobile Edge Computing Networks. Submitted, *IEEE Transactions on Mobile Computing*, Oct. 2020.
- R3. S. Hosseinalipour, S. Azam, C. Brinton, V. Aggarwal, H. Dai, D. Love. Multi-Stage Hybrid Learning over Large-Scale Fog Networks. Submitted, *IEEE/ACM Transactions on Networking*, Oct. 2020.
- R2. S. Palacios, A. Ault, J. Krogmeier, B. Bhargava, C. Brinton. AGAPECert: An Auditable, Generalized, Automated, Privacy-Enabling Certification Framework with Oblivious Smart Contracts. Submitted, *IEEE Transactions on Dependable and Secure Computing*, Jul. 2020.
- R1. J. Kim, T. Kim, M. Hashemi, C. Brinton, D. Love. Joint Optimization of Signal Design and Resource Allocation in Wireless D2D Edge Computing. Submitted, *IEEE/ACM Transactions on Networking*, May 2020.

Patents

- P2. C. Brinton, W. Chen, M. Chiang, S. Ha, R. Rill. System and Method for Automated Course Individualization via Learning Behaviors and Natural Language Processing. *U.S. Patent #10,339,822*. Issued July 2019.
- P1. C. Brinton, M. Chiang, S. Ha, W. Ju, R. Rill, J. Walker. Systems and Methods to Assist an Instructor of a Course. *U.S. Patent #14/712,108*. Filed May 2015.

GRANTS

Current/Awarded

- Purdue PI (with Raytheon BBN Technologies [lead], and Purdue co-PIs David Love, James Krogmeier, and Chih-Chun Wang). National Spectrum Consortium (NSC). “Dynamic Spectrum Sharing 5G Network Enhancements Prototype.” Oct 2020 – Dec 2023. (\$8,000,000 total, \$1,500,000 to Purdue)
- Purdue PI (with UNM [lead], CMU, ISU, KU, and WSU). National Science Foundation (NSF). “SII Planning: Spectrum-Agile Cognitive Communications for Terrestrial and Space Applications.” Aug 2020 – Jul 2021. (\$300,000)
- PI (with K. Douglas). Charles W. Cook Jr. Foundation. “Machine Learning for Social Learning Networks.” Aug 2020 – Jul 2021. (\$250,000)
- Co-PI (with D. Love, PI). MIT Lincoln Labs. “Machine Learning Techniques for Future Satellite Communication Networks.” Mar 2021 – Feb 2022. (\$150,000)
- Co-PI (with J. Allebach, PI). Hewlett Packard 3D Marketing. “3D Marketing Data Science.” Sept 2020 – Aug 2021. (\$65,000)

Recently Completed

- PI (with S. Bagchi). Northrop Grumman Cybersecurity Research Consortium (NGCRC). “A Privacy-Preserving Predictive Modeling Architecture for Edge Computing.” Sept 2019 – Dec 2020. (\$125,000)
- PI (with D. Love, T. Kim, and M. Hashemi). Naval Surface Warfare Center Crane Division. “Distributed Machine Learning and Sensor Fusion for Spectrum Sensing System Optimization.” May 2020 – Aug 2020. (\$500,000, but only Phase 1 awarded)

Select Pending

Office of Naval Research. “Network-Aware Distributed Machine Learning and Sensor Fusion for Spectrum System Intelligence.” Submitted Dec 2020.

NSF CNS Medium: GOALI. “Communication-Computation Co-Design for Rural Connectivity and Intelligence under Nonuniformity: Modeling, Analysis, and Implementation.” Submitted Nov 2020.

Ford Motor Company. “Signal Processing and Machine Learning Approaches to Multiple Antenna Positioning for Phone as a Key (PaaK).” Submitted Sept 2020.

NSF CNS NeTS. “CAREER: Enabling Large-Scale Distributed Learning Optimization in Heterogeneous Network Systems.” Submitted Aug 2020.

Site Visits

NSF Platforms for Advanced Wireless Research (PAWR). “TOWER Testbed for Open Wireless Experimental Research in Rural Communities.” Virtual site visit in May 2020.

INVITED PRESENTATIONS

Talks

“Migrating from Federated Learning to Fog Learning.” Invited seminar. IEEE Winter School on Fog/Edge Computing, IIT Kanpur (virtual). Dec 2020.

“Network-Aware Distributed Machine Learning for Fog/Edge Computing.” Invited seminar. Raytheon, El Segundo, CA. Oct 2019.

“Data Science Meets Network Science.” Invited seminar. Purdue Integrative Data Science Initiative, West Lafayette, IN. Sept 2019.

“Data Science Meets Network Science: Modeling and Optimizing Social Learning Networks.” Invited seminar. Purdue University, College of William and Mary, New Jersey Institute of Technology, University of Maryland, Brown University, and University of Minnesota. Spring 2019.

“A Lens into AI for Learning.” Organizer talk. Data Science for eLearning, Coursera, Mountain View, CA. Mar 2018.

“Technology and Pedagogy: Using Big Data and AI to Enhance eLearning.” Invited lecture. DEGREE meeting. Chegg, San Francisco, CA. Dec 2017.

“Learning Analytics and Personalization: A Behavior-Based Approach.” Organizer talk. 2017 KDD Workshop on Advancing Education with Data, Halifax, Canada. Aug 2017.

“The Power of Networks: What Facebook, Cell Phones, and Online Courses Have in Common.” Engineering Week Keynote Lecture, The College of New Jersey, Ewing, NJ. Feb 2017.

“Beyond Assessment Scores: How Behavior Can Give Insight into Knowledge Transfer.” Invited talk. NIPS Workshop on Machine Learning for Education, Barcelona, Spain. Dec 2016.

“The Next Generation of Learning Technologies.” Invited talk. Trenton Computer Festival, Ewing, NJ. Mar 2016.

“Pedagogy and Technology: Leveraging Big Data to Enhance the Quality of Human Learning.” Invited talk. Bell Labs, Murray Hill, NJ. Nov 2015.

“Improving the Quality of Massively Scaled (Human) Learning Through Machine Learning.” Invited Seminar. Department of Computer and Information Sciences, University of Delaware, Newark, DE. May 2015.

“Social Learning Networks: Enhancing the Engagement and Efficacy of Learning.” Invited talk. Applied Communication Sciences, Basking Ridge, NJ. Apr 2015.

Panelist

“5G Security.” 21st CERIAS Annual Security Symposium, Purdue University, West Lafayette, IN. Sept 2020.

“Utilizing Data Science as a Strategy.” Data Science for eLearning, Udemy, San Francisco, CA. Apr 2017.

“Education Innovation Panel: Pedagogy and Technology.” Keller Center 10th Anniversary Symposium, Princeton University, Princeton, NJ. Oct 2015.

“Massive Open Online Courses: Reflections, Challenges, and Opportunities.” 65th Annual United Nations DPI / NGO Conference (Program: Recovering Stolen Childhoods Through Education: Utilizing the Tools of the Digital Age), New York City, NY. Aug 2014.

“Online Courses: Issues and Opportunities.” The MOOC Experience: Faculty Reflections, William Patterson University, Wayne, NJ. Oct 2013.

“Practical Issues Dealing with Online Courses / Flipped Courses.” The Role of Technology in Postsecondary Education, Princeton University, Princeton, NJ. May 2013.

Webinars and Podcasts

“Revolutionizing an Industry.” Podcast. American Mathematical Society, Mathematical Moments Episode 139, Sept 2018.

“New Perspectives on Improving Business Outcomes through Better Measurement and Online Learning Design.” Webinar. Cognizant, Teaneck, NJ. Jun 2018.

“The Power of Networks.” Podcast. Smart People Podcast, Episode 268, Apr 2017.

TEACHING EXPERIENCE

ECE 20875: Python for Data Science (Purdue, Instructor and co-developer) *Fall 2019 - Present*

This course introduces Python programming to students through data science problems. Students learn Python concepts as well as introductory data science topics such as regression, clustering, and neural networks.

- Typical enrollment: 300 students
- Responsibilities: Overall course organization, creating/delivering lectures, creating exams and assignments, mentoring final projects, managing TAs, and holding office hours.

ELE/APC 486: Transmission and Compression of Information (Princeton, Lecturer) *Spring 2019*

This course covers the fundamental algorithms and limits of data compression and transmission, detailing key components of information theory and coding theory. It is an elective for students in EE and math.

- Typical enrollment: 10 students
- Responsibilities: Creating/delivering lectures, creating and grading exams, creating and grading problem sets, and holding office hours.

ELE/COS 381: Networks: Friends, Money, and Bytes (Princeton, Lecturer) *Fall 2017, Spring 2019*

This course teaches social, economic, and technical networks with data science, optimization, linear algebra, and machine learning. It is interdisciplinary, taken by students in EE, CS, ORFE, economics, and other majors.

- Typical enrollment: 80 students
- Responsibilities: Creating/delivering lectures, creating exams, mentoring final projects, managing TAs, holding office hours.

ELE 206 / COS 306: Contemporary Logic Design (Princeton, Lecturer) *Fall 2018*

This course teaches the basic concepts in logic design that form the basis of computation and communication circuits, such as logic gates, memory elements, and finite state systems. It is a core class for EE and an elective for COS.

- Enrollment: 105 students
- Responsibilities: Creating/delivering/recording lectures, organizing labs, managing TAs, holding office hours.

ENG 150: Foundations of Engineering (Princeton, Lecturer) *Summer 2018*

This course provides a hands-on introduction to the foundational principles of engineering, including calculus, physics, circuit construction, and computational data analysis. It is for incoming Princeton students prior to freshman year.

- Enrollment: 18 students
- Responsibilities: Creating/delivering lectures, running labs, managing TAs, holding office hours.

ELE 201: Information Signals (Princeton, Lecturer) *Spring 2018*

This course teaches mathematical tools to analyze and manipulate both signals that carry information as well as systems that respond to signals and produce outputs. It is a core class for EE and also taken by COS and math.

- Enrollment: 37 students.
- Responsibilities: Creating/delivering lectures, creating exams, managing TAs, holding office hours.

ENG 342: Advanced Engineering Math II (TCNJ, Adjunct Professor) *Fall 2016, Spring 2017*

This course covers a range of topics in probability/statistics, machine learning, and partial differential equations. It is taken by juniors and seniors in electrical, computer, mechanical, and biomedical engineering.

- Typical enrollment: 30 students.
- Responsibilities: Lecturing, creating/delivering exams and homeworks, grading, holding office hours.

Fog Networks and the Internet of Things (MOOC, Instructor) *Fall 2017 - Present*

This course covers Fog networking, the key trend of pushing computation, storage, and communication tasks from the cloud towards the network edge. In doing so, it discusses the Internet of Things, a key network enabled by Fog.

- Enrollment: 20,000 students since 2015.
- Responsibilities: Creating lecture videos, responding to forum questions, offering virtual office hours.

Networks Illustrated: Principles Without Calculus (MOOC, Instructor) *Summer 2013 - Present*

This Massive Open Online Course (MOOC) explains the fundamental principles behind social, economic, and technical networks. It is based on my textbook *The Power of Networks: Six Principles That Connect our Lives*.

- Enrollment: 150,000 students since 2013.
- Responsibilities: Creating lecture videos, responding to forum questions, making homeworks/exams.

Networks: Friends, Money, and Bytes (MOOC, Instructor) *Fall 2012 - Present*

This is the online version of Networks: Friends, Money, and Bytes. It was among the first six MOOCs by Princeton.

- Enrollment: 250,000 students since 2012.
- Responsibilities: Responding to forum questions, making homeworks/exams, offering virtual office hours.

ELE 381: Networks: Friends, Money, and Bytes (Princeton, lead TA) *Fall 2012*

This is the course I am a lecturer for now. It was the first-ever offering of a STEM course in “flipped classroom” format at Princeton, where lecture videos were watched before class and class time was used for discussion.

- Enrollment: 30 students.
- Responsibilities: Managing Q&A sessions, setting up real-time demonstrations during class, making/grading homeworks/exams, mentoring final course projects.

MENTORING EXPERIENCE

Postdoctoral Researchers (current)

Seyyedali Hosseinalipour: Summer 2020 – Present

PhD Students (current)

Sheik Shams Azam: Fall 2019 – Present
Junghoon Kim (co-advised with David Love): Fall 2019 – Present
Frank Lin (co-advised with Nicolo Michelusi): Fall 2019 – Present
Henry Wang: Fall 2019 – Present
Rajeev Sahay: Spring 2020 – Present
Myeung Suk Oh (co-advised with David Love): Spring 2020 – Present

Masters Students (current)

Somosmita Mitra (co-advised with Tom Talavage): Fall 2019 – Present

Undergraduate Research Students (current)

Minjun (Jess) Zhang: Summer 2020 – Present
David Nickel: Fall 2020 – Present

Masters Students (completed)

Tsung-Yen Yang (Fall 2016 – Spring 2019): *Learning Informative and Private Representations via Generative Adversarial Networks*
Jessica Ko (Fall 2015 – Spring 2017): *MOOC User Behavior Analysis: Insight from Topic Analysis and Application to Performance Prediction*

Undergraduate Research Students (completed)

Mahd Khan (Fall 2018 – Spring 2019): *Deep Learning for Improvement of Autonomous Vehicle Navigation*
Madhumitha Shridharan (Summer 2018 – Spring 2019): *Assessing the Efficacy of Deep Learning for MOOC Behavior-based Prediction*
Caeley Harihara (Summer 2018 – Spring 2019): *Data Mining and Feature Engineering of MOOC Clickstreams for Predictive Learning Analytics*
Ankit Buddhiraju (Fall 2014 – Spring 2015): *Dynamic Centrality Measures for Financial Contagion: New Paradigms for Modeling Dynamic Graphs across Disciplines*
Pranav Ghokale (Fall 2014 – Spring 2015): *TypeAway: Development of a Gesture-Based Typing System*
Vaidhy Murti (Fall 2014 – Spring 2015): *Mod-omate: Automated Moderation on Anonymous Social Media Apps*
George Touloumes (Fall 2013 – Spring 2014): *Visualizing Instructor Feedback for Video-Based Online Courses*
Ankit Buddhiraju (Fall 2013 – Spring 2014): *Mercury Model: A Unified Approach to Studying Dynamic Networks*
Jian Min Sim (Fall 2012 – Spring 2013): *Investigation of Information Propagation in Social Search*
Harvest Zhang (Fall 2012 – Spring 2013): *Profiling and Visualizing Student Performance in MOOCs*
Rohan Sharma (Fall 2012 – Spring 2013): *Evaluating Amazon's Ranking Algorithm*

Industry Researchers

Adam Hare (Dec 2019 – Present): Data Scientist/Researcher/Full-Stack Developer
Elizabeth Tenorio (Jan 2018 – Present): Lead Data Scientist
Yuwei Tu (Apr 2018 – Spring 2020): Data Scientist

Amanda Mason-Singh (Feb 2017 – May 2018): Lead Data Scientist

Joseph Urciuoli (Sept 2016 – Nov 2017): Lead Data Engineer

Weiyu Chen (Jul 2015 – Nov 2018): Lead Data Scientist

Da Cao (Mar 2015 – Oct 2019): Data Engineer

Ying Xiong, Patrick Hansen, Richard Junior Bustamante (Jun 2018 – Aug 2018): Undergraduate Interns

Charlton Lu (Jun 2016 - Aug 2016, Jun 2017 – Aug 2017): High School Intern

Advait Chauhan, Derrick Xin, Sean Yun (Jun 2015 – Aug 2015): Undergraduate Interns

PhD Committee Membership or Examiner

Miguel Villarreal-Vasquez, Purdue Computer Science (Defended June 2020); Ganapathy Mani, Purdue Computer Science (Defended April 2020)

ACADEMIC SERVICE

Conference Workshop/Session Organizer

Fog/Edge Computing and Networking for 5G and Beyond IoT. World Forum on Internet of Things, June 2021.

Workshop on Distributed Machine Learning and Fog Networks. IEEE INFOCOM, Apr 2021.

Foundations and Applications of Data Science. IEEE CISS Session, Mar 2020.

Workshop on Data Mining for eLearning Personalization. IEEE ICDM, Nov 2018.

Workshop on Advancing Education with Data. ACM SIGKDD, Aug 2017.

Conference Technical Program Committees

IEEE Conference on Computer Communications (INFOCOM) 2019, 2020, 2021

IEEE International Conference on Distributed Computing Systems (ICDCS) 2021

AAAI Conference on Artificial Intelligence 2021

IEEE Vehicular Technology Conference 2020

IEEE Sarnoff Symposium 2020

Committee Member, Purdue University

Purdue ECE's Foundations of Data Science Faculty Search Committee 2019 - 2020

Purdue ECE's Graduate Committee 2019 - Present

Faculty Advisor, Purdue University

IEEE Student Organization 2019 - Present

ECE Graduate Student Association 2019 - Present

Peer Reviewer

IEEE/ACM Transactions on Networking 2016 - Present

IEEE INFOCOM 2017 - Present

IEEE Transactions on Wireless Communications 2020 - Present

NeurIPS 2018, 2019

<i>IEEE ICDM</i>	2018, 2019
<i>Entropy</i>	2019
<i>ACM SIGKDD</i>	2017, 2018
<i>IEEE Transactions on Learning Technologies</i>	2014 - 2017
<i>IEEE Transactions on Emerging Topics in Computing</i>	2015 - 2017
<i>Elsevier Computers & Education</i>	2015 - 2017
Proposal Review Panelist	
<i>NSF Computer and Network Systems (CNS)</i>	2020
Alumni Interviewer , Princeton University	2016 - 2018
Chief Coordinator and Co-Founder , 3 Nights and Done (3ND)	2012 - 2015
Alumni Mentor , TCNJ School of Engineering	2012 - 2014
President and Co-Founder , TCNJ Engineering Honor Society (now Tau Beta Pi)	2010 - 2011
Vice President , TCNJ IEEE Student Organization	2009 - 2010

AWARDS AND HONORS

2020 Ruth and Joel Spira Outstanding Teacher Award (Jul 2020): Awarded to one faculty member in Purdue ECE each year.

Purdue Outstanding Faculty Mentor of Engineering Graduate Students (Feb 2020): Awarded to one faculty member in Purdue ECE each year.

Purdue Seed for Success Award (Oct 2019): Awarded for efforts in obtaining an external sponsored research award of \$1 million or more.

Princeton Engineering Commendation List for Outstanding Teaching (Aug 2019): Awarded for high teaching evaluations received during the spring 2019 semester.

Distinguished Member of the INFOCOM TPC (Feb 2019): Awarded based on ratings of reviews written for papers submitted to INFOCOM 2019.

INFOCOM Best-in-Session Presentation Award (Apr 2018, Apr 2016): Awarded for having the highest rated presentation in my corresponding sessions at INFOCOM 2016 and 2018.

Bede Liu Best Dissertation Award in Electrical Engineering (May 2016): Awarded to one graduating PhD student in Princeton's EE Department each year.

Yan Huo '94 Graduate Fellowship in Electrical Engineering (Dec 2015): Awarded to three graduate students in Princeton's EE Department each year.

Outstanding Teaching Assistant Award (Sept 2013): Awarded after being an assistant instructor for ELE/COS 381, both at Princeton (in-class) and on Coursera (online).

Princeton University Research Assistantship (Jun 2012 - May 2016): Awarded full tuition and stipend by Princeton for my PhD research.

Princeton University First Year Fellowship (Sept 2011 - May 2012): Awarded full tuition and additional compensation for my first year of graduate studies at Princeton.

TCNJ School of Engineering Banner Bearer (May 2011): Awarded at graduation for obtaining the highest GPA of all graduating engineers from TCNJ in 2011.

Engineer in Training (Sept 2011): Awarded for passing the Fundamentals of Engineering (FE) exam in 2011.

TCNJ Fred O. Armstrong Scholars Award in Electrical Engineering (2008 - 2011): Obtained the highest-in-class GPA of Electrical Engineers. Received each year during my undergraduate studies.

PROFESSIONAL AND HONORARY SOCIETY AFFILIATIONS

IEEE

Senior Member	<i>2020 - Present</i>
Member	<i>2016 - 2020</i>
Student Member	<i>2008 - 2016</i>

Tau Beta Pi (NJ Zeta) Engineering Honor Society	<i>2013 - Present</i>
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UNDERGRADUATE RESEARCH POSITIONS

<i>AT&T Labs</i> , Optical Systems Research Group, Middletown, NJ	<i>Jun 2010 - Aug 2010</i>
<i>Linearizer Technology</i> , RF Research Group, Hamilton, NJ	<i>May 2009 - Dec 2009</i>
<i>AT&T</i> , Transport Field Technical Support, Bedminster, NJ	<i>Jun 2008 - Aug 2008</i>

CV last updated: January 24, 2021