

Raymond H. Tu

Computer Scientist · Data Scientist · ML/AI Educator · ML/AI Researcher · ML/AI Program Manager

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Summary

- Faculty Leader & Founder of FIRE Capital One Machine Learning at UMD (2018 - 2022)
- PhD - Computer Science (2017)
- BS - Computer Science (2010)
- Former Teaching & Research Assistant
- Former Software Engineer & Product Manager
- Experienced in ML/AI, Data Science, & Cybersecurity.
- Interested and skilled in ML/AI Training & Mentorship.
- Interested and skilled in ML/AI Research & Engineering.
- Interested and skilled in ML/AI Program Development.
- Interested and passionate about technology startups & entrepreneurship.

Experience

University of Maryland

College Park, MD

Faculty Leader, Machine Learning

Jan 2018 - Present

- Founded, operated, and grew a highly sought-after ML/AL research mentorship program at UMD, graduated 100+ undergrad students with CS-related degrees, and helped them land professional careers or enrollment in Master's/PhD programs.
- Guided and mentored undergrad students and peer research mentors at a rate of 30+ each year, providing an experiential learning program based on state-of-the-art ML/AI research, hands-on projects, deep mentorship, and collaborative processes.
- Designed and taught 20+ ML/AI topics, research papers, and hands-on tutorials in applied areas such as object detection, image segmentation, face recognition, audio recognition, game playing, text translation, text generation, time-series prediction, recommender systems, and many more.
- Organized and directed 30+ ML/AL project teams based on Scrum framework, at a rate of 4-10 teams each year, set and communicated individual and team goals, regularly monitored and provided feedback for individual and team progress.
- Designed, built, tested, and refined ML/AI models in Python, TF/Keras, PyTorch, and Scikit-Learn, using state-of-the-art models and techniques such as CNNs, Transformers, GANs, VQ-VAEs, DQNs, Representation Learning, Hard Example Mining, Transfer Learning, etc.
- Led and organized interactive classroom discussions, effective team meetings, and small group research discussions, based on innovative and evidence-based teaching methods, such as project-based learning, problem-solving discussions, effective collaborative processes, etc.
- Deployed, published, and released ML/AI applications and code repositories on GitHub, Hugging Face, Colab, Docker, AWS/Google Cloud.
- Co-authored and published an ML/AI paper in computer vision, advised and edited 20+ research posters and presentations.
- Designed and published marketing materials for the web and web 2.0 platforms (such as YouTube, Instagram, Twitter, and Medium).
- Fostered and cultivated a people-oriented environment that strongly values community, mentorship, diversity, and inclusion.
- Initiated and organized community and networking events for students with industry partners and faculty colleagues.
- Designed, furnished, and maintained a lab and co-working space for individual work and team collaborations.
- Talked and presented at teaching and research conferences and panel discussions.
- Led and organized faculty committee assignments and discussions.
- Website: <https://go.umd.edu/ml>
- Supervisors: Dr. Patrick/Patricia Killion and Dr. Ian Page.

Arizona State University

Tempe, AZ

Graduate Research Assistant

May 2014 - Dec 2017

- Spearheaded a series of research projects from start to finish with minimal supervision.
- Published several prominent papers and led the application of a US patent.
- Received awards for publishing two best papers at top academic conferences, acquiring a US patent, making distinguished academic performance, and winning programming/hackathon competitions.
- Advisors: Dr. Adam Doupe and Dr. Gail-Joon Ahn

Graduate Teaching Assistant / Lab Instructor

Jan 2012 - Sep 2014

- Taught, graded, and provided hands-on lab instructions for a series of graduate and undergrad computer science courses, including: Distributed Software Development, Database Management System Implementation, Software Integration, Information Assurance and Security, Computer Networks, Computer Science Capstone Project, Principles of Programming in Java, and Introduction to Programming Languages.

Eventbrite

San Francisco, CA

Software Engineer (Intern)

Jun 2013 - Aug 2013

- Developed software features for Eventbrite mobile app.
- Implemented unit testing and QA automation code for CI/CD.

Product Manager

Jun 2010 - May 2011

- Analyzed and proposed features for ATM software development.
- Coordinated international talent recruitment.

Education

Arizona State University

Ph.D. in Computer Science

2011 - 2017

- Specializations: Data Science and Cybersecurity
- Awards: Graduate Fellowship Award
- Dissertation: From Understanding Telephone Scams to Implementing Authenticated Caller ID Transmission

University of Nottingham

B.Sc. Hons. in Computer Science

2007 - 2010

- Specialization: Machine Learning
- Awards: First Class Honors
- Dissertation: A Machine Learning Scheme to Model and Predict Currency Foreign Exchange Rates

Program Committees

- 2020-22 **FIRE Tech & Applied Sciences Committee**, Leader and advisor of FIRE technology & applied science streams.
- 2022 **FIRE Semester 1 Committee**, Member for FIRE Semester 1 course design and assessment materials.
- 2022 **FIRE Summer Initiatives Committee**, Member for FIRE summer events and activities planning.
- 2019-20 **FIRE Marketing Committee**, Chair and member for FIRE marketing materials and social media content.

Publications

View all of my publications @ <https://huahongtu.me/publications>

Projects

View my recent projects @ <https://www.linkedin.com/in/raymond-huahong-tu>

Honors & Awards

- 2019 **Distinguished Paper Award**, For a paper published and presented in the proceedings of the USENIX Security.
- 2016 **Graduate Fellowship**, For excellent research progress and strong academic work at the Arizona State University.
- 2016 **Best Paper Award**, For a paper published and presented in the proceedings of the ITU Kaleidoscope.
- 2015 **Money20/20 Hackathon Finalist**, For creating BridgePay: Using Visa Direct to send money to anyone.
- 2013 **Boron Award**, For delivering a flawless solution to one of Codility's programming challenges.

Skills

- Interpersonal Skills** Coaching, Collaboration, Communication, Empathy, Kindness, Leadership, Mentorship, Negotiation, Visual Presentation, Public Speaking, Relationship Building, Teaching, Writing
- Industry Knowledge** A/B Testing, Agile Methodologies, Algorithms, Artificial Intelligence (AI), Autonomous Systems, Cloud Infrastructure, Computer Networking, Computer Vision, Continuous Integration and Deployment (CI/CD), Cryptography, Cybersecurity, Data Analytics, Data Management, Data Mining, Data Preprocessing, Data Science, Data Structures, Data Visualization, Deep Learning, DevOps, Digital Marketing, Distributed Systems, Facial and Biometric Recognition, Fraud and Malware Detection, Graphic Design, Growth Mindset, Image Segmentation, Intelligent Agent Systems, Lean Startup, Machine Learning (ML), Machine Translation, Mathematics, MLOps, Mobile App Development, Multivariate Testing, Natural Language Processing (NLP), Object Detection, Operational Management, Predictive Modeling, Program Development, Programming, Project Management, Quality Assurance (QA), Recommender Systems, Reidentification and Tracking, Research, Scalability, Scrum, Search and Information Retrieval, Software-Defined Networking, Software Development and Engineering, Speech and Voice Recognition, Statistics, Telecommunications, Test-Driven Development, Time-Series Forecasting, Unit Testing, Unsupervised Learning, Version Control, Video Editing, Web Development, Web Services
- ML Models & Techniques** Annotation and Labeling, Anomaly Detection, Autoencoder, BERT, Boosting Algorithms, Clustering, Convolutional Neural Networks (CNN), Data Augmentation, Data Imputation, Data Sampling, Decision Trees, Deep Generative Models, Deep Q-Learning, Dimensionality Reduction, Distance and Similarity Measures, Dropout and Weight Pruning, Ensemble Learning, Feature Learning, Feature Pooling and Rescaling, Feature Selection and Extraction, Generative Adversarial Networks (GAN), Graph Neural Networks (GNN), Hard Example Mining, Hyperparameter Optimization, k-Nearest Neighbors, Knowledge Distillation, Learning to Rank, Linear and Logistic Regression, Loss Functions, Metric Learning, Model Quantization, Model Validation and Evaluation, Naive Bayes Classifier, Normalization, Random Forest, Recurrent Neural Networks (RNN), Regularization, Reinforcement Learning, Residual Neural Network (ResNet), Supervised Learning, SVM, Transfer Learning, Transformer and Attention Learning, Variational Autoencoder, Vector Quantization, Word2vec, Word Embedding
- SW Tools & Frameworks** Akka, Android, AWS, Bash, CSS, Docker, Excel, GCP, Git, HTML, Java, JavaScript, Jenkins, Latex, Linux, Markdown, Matplotlib, MongoDB, Numpy, Pandas, PyG, Python, PyTorch, Scala, Scikit-Learn, SpaCy, SQL, TensorFlow, TypeScript, Weka

Courses

- Graduate** Advanced Computer Network Security, Applied Cryptography, Artificial Intelligence, Combinatorial Algorithms and Intractability, Computer Network Security, Database Management System Implementation, Data Mining, Dissertation, Distributed Software Development, Information Assurance and Security, Practicum, Reading and Conference, Research, Social Media Mining, Software Design, Software Integration and Engineering, Software Quality Assurance and Testing, Software Security, Statistical Learning and Pattern Recognition, Statistical Machine Learning, Web and Multimedia Databases
- Undergraduate** Advanced Computer Communications, Algorithmic Problem Solving, Algorithms and Data Structures, Artificial Intelligence Methods, Computer Communications and Networks, Computer Security, Computer Systems Architecture, Concepts of Concurrency, Database Systems, Decision Support Methodologies, Developments in Digital Business, Digital Business Communications, Functional Programming, Individual Dissertation, Internet and Web Services, Introduction to Artificial Intelligence, Introduction to Business Operations, Introduction to Software Engineering, Introduction to Vision and Graphics, Large Scale Systems Design, Machines and Their Languages, Mathematics for Computer Scientists, Object-oriented Methods, Operating Systems, Programming, Skills for Communicating Information, Software Engineering Group Project, Unix and Software Tools, Web Programming and Scripting

Hobbies & Interests

-  Hiking
-  Biking
-  Nature
-  Food
-  Music
-  Gaming
-  Learning
-  Teaching