Raymond H. Tu

Computer Scientist · Data Scientist · Research Scientist · Software Engineer · Solutions Consultant

raymond@huahongtu.me | huahongtu.me | raymond-huahong-tu

Summary

- Core Contributor of Fraud AI Team at Wells Fargo
- PhD - Computer Science
- Experienced in ML/AI, Data Science, & Cybersecurity
- Former Faculty & Founder of ML/AI Program at UMD
- Former Teaching & Research Assistant
- Former Software Engineer & Product Manager
- Interested and skilled in Research & Analysis
- Interested and skilled in Systems Design
- Interested and skilled in Software Engineering
- Interested and skilled in Program Development
- Interested and skilled in Mentorship & Training
- Interested and skilled in Operations Management

Experience

Wells Fargo — *Chandler, AZ*

Sr. Artificial Intelligence Solutions Consultant, Fraud Detection & Management — *Feb 2018 - Present*

- Core Contributor for the Fraud Artificial Intelligence Team.
- Key focus on modernizing the fraud detection and response stack, with a focus on real-time response capabilities.
- Capabilities include building advanced AI models in a cloud-native environment, using GNNs, and working closely with the product development team to build and mature competencies in this space.

University of Maryland — *College Park, MD*

Faculty Leader, Machine Learning — *Jan 2018 - Dec 2022*

- 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 gain admission to 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 agile 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, RNNs, 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, active-learning 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.
- Supervisors: Dr. Patrick/Patricia Killion and Dr. Ian Page.
- Website: https://go.umd.edu/ml

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 distinguished papers at top academic conferences, writing a US patent, and winning programming/hackathon competitions.
- Advisors: Dr. Adam Doupé 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.

GRG Banking Equipment (HK) Co. Limited.

Guangzhou, China

Product Manager

Jun 2010 - May 2011

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

Education

Arizona State University

Doctor of Philosophy - PhD, 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

Bachelor of Science - BS, Computer Science

2007 - 2010

- Specialization: Machine Learning
- Awards: First Class Honours
- 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 symposium.

2016 **Graduate Fellowship Award,** 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 symposium.

2015 **Hackathon Finalist,** For creating BridgePay: Using Visa Direct API to send money to anyone at the Money20/20 hackathon.

2013 **Boron Award,** For delivering a flawless solution to one of Codility's competitive programming challenges.

Skills

Interpersonal Skills Coaching, Collaboration, Communication, Empathy, Growth Mindset, Leadership, Mentorship, Negotiation, Presentation, Psychology, Public Speaking, Relationship Building, Teaching, Team Management, Writing

Technical Knowledge A/B Testing, Agile Methodologies, Algorithms, API Development, Artificial Intelligence (AI), Autonomous Systems, Cloud Infrastructure, Computer Networking, Computer Vision, Continuous Integration and Deployment (CI/CD), Cryptography, Cybersecurity, Data Analysis, Data Engineering, Database Management, Data Mining, Data Science, Data Structures, Data Visualization, Deep Learning, DevOps, Digital Marketing, Distributed Systems, Experimental Design, Facial Recognition, Fraud Detection, Identity and Access Management, Image Segmentation, Lean Startup, Machine Learning (ML), Machine Translation, Mathematics, MLOps, Mobile App Development, 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, Statistical Analysis, System Design, Telecommunications, Test-Driven Development, Time-Series Forecasting, Unit Testing, Version Control, Voice Recognition, Web Development, Web Services

ML Models & Techniques Active Learning, Adversarial Learning, Annotation and Labeling, Anomaly Detection, Autoencoder Models, BERT, Boosting Algorithms, Clustering, Convolutional Neural Networks (CNN), Data Augmentation, Data Imputation, Data Normalization, Data Sampling, Decision Tree Models, Deep Generative Models, Deep Q-Learning, Dimensionality Reduction, Distance and Similarity Measures, Dropout and Weight Pruning, Ensemble Learning, Feature Engineering, Feature Learning, Feature Pooling, Feature Scaling, Feature Selection and Extraction, Generative Adversarial Networks (GAN), Graph Neural Networks (GNN), Hard Example Mining, Hyperparameter Tuning, 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, Optimization Algorithms, Random Forest, Recurrent Neural Networks (RNN), Regularization, Reinforcement Learning, Residual Neural Network (ResNet), Semi-supervised Learning, Supervised Learning, Support Vector Machine (SVM), Transfer Learning, Transformers and Attention Learning, Unsupervised Learning, Vector Quantization, Word2vec

SW Tools & Frameworks Akka, Android Studio, AWS, Bash, CSS, Docker, Excel, GCP, Git, HTML, Java, JavaScript, Jenkins, Jupyter, Keras, Latex, Linux, Markdown, Matplotlib, MongoDB, NetworkX, Numpy, Pandas, PyG, PySpark, Python, PyTorch, Scala, Scikit-Learn, SciPy, Seaborn, 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