Songlin Hou (Ray Hou)

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EDUCATION

Georgia Institute of Technology (Gatech), Atlanta, GA
Master of Science in Computer Science
University of Texas at Austin (UTAustin), Austin, TX
Master of Science in Data Science

INTERESTS

data analysis, computer vision, machine learning, deep learning, computer graphics, human-computer interaction

SKILLSET

- **Backend**(Python, Java, C#, C++, C, Bash, Assembly)
- **Frontend** (HTML, JS, TS, CSS, SCSS, XML)
- **Framework** (Angular, Electron, Bootstrap, Xamarin, NativeScript, Ionic, Qt, VueJS, React)
- **Cloud/Database** (Docker, AWS, GCP, MapReduce, Spark, Oracle, MySQL, MongoDB)
- **Scientific** (Scikit, TensorFlow, PyTorch, Keras, OpenCV, Open3D)
- **Other** (Android Dev., Game Dev., PPT, Photoshop)

EXPERIENCE

Software Development Engineer, *Dell Technologies* *06/2021-current*
Field: Performance Forecast, Anomaly Detection, Metrics Analysis, CAC/PIV Security

Teaching Assistant, *Worcester Polytechnic University* *01/2021-05/2021*
Course: Operating System, Java Programming

Research Intern, *Yale University* *08/2020-11/2020*
Field: Natural Language Processing, Encoding/Decoding, SQL Generation

AI/ML/DS Intern, *Dell EMC* *06/2020-08/2020*
Field: Isilon Root Cause Analysis, Troubleshooting System Design

Research Assistant, *The Hong Kong Baptist University* *08/2020-10/2020*
Field: COVID-19 Detection (BLE), Root Cause Tracing

Research Assistant, *The Hong Kong Polytechnic University* *07/2018-05/2019*
Field: Application of Blockchain, Traffic Analysis, Structure Optimization

Research Assistant, *The Hong Kong Polytechnic University* *03/2016-10/2016*
Field: Mobile Indoor Localization, AR Navigation

PROJECTS

1. Troubleshooting Platform Design for Storage Triage, Dell EMC
Design a data-driven dependency graph abstraction for common troubleshooting cases.
Implement a highly customizable and scalable troubleshooting platform with expert system and state machines.

2. Text2SQL, Learning-based approach to generate SQL from natural language, Yale University
Integrate and deploy an encoder-decoder model which can generate syntax correct SQL from natural language.
Join rule-based result explanation model design which can describe a SQL using natural language.
Design a web interface that allows users to interact with databases using the model.

3. Medical Image Analysis on Chronic Wound Segmentation, Worcester Polytechnic Institute
Improve the U-Net model on the segmentation accuracy with environment light enhancement.
Adjust the segmentation model to fit with chronic wound images.

4. Covid-19 Tracking App Based on BLE, The Hong Kong Baptist University
Implement a protocol that allows users to identify nearby virus carriers without privacy leakage.
Design an Android application that uses BLE to collect anonymous information of people nearby.

5. Traffic Analysis and Modeling on IoT Blockchain Systems, Hong Kong Polytechnic University
Develop a Bitcoin-like distributed system using the Flask framework deployed on 20 virtual machines.
Implement the PoW mining protocol, which ensures each node can reach a consensus.
Perform traffic analysis by designing a machine learning model, achieving 85% accuracy in traffic prediction.

6. Android Indoor Localization Based on Vision Analysis and Fingerprint Detection, Research
Develop an Android app to locate users based on Wi-Fi signals, visual input, accelerators, geomagnetism etc.
Optimize machine learning model to achieve real-time indoor localization with an accuracy over 80%.

7. Portrait Chocolate 3D Printing Platform, Intel International Competition(1st Prize)
Develop a chocolate 3D printer program that runs on Intel chips (Win10) using C#.
Implement interfaces for 3D printer control using serial communication (C and C++).
Design and implement the slicing algorithm for the 3D printer in C.

8. "What you see is what you get" (WYSIWYG) News Publishing Apps, National Software Competition(1st Prize)
Develop an Android application as a client program as well as a server program for news publication.
Develop a visual editor to publish news to client apps.
Implement built-in customer analysis to find the potential patterns in users' preferences.

PUBLICATIONS

1. Loss Distillation via Gradient Matching for Point Cloud Completion with Weighted Chamfer Distance (IROS 2024)
2. Hyperbolic Chamfer Distance for Point Cloud Completion (International Conference on Computer Vision 2023)
3. InfoCD: A Contrastive Chamfer Distance Loss for Point Cloud Completion (Conference on Neural Information Processing Systems 2023)
4. EPAR: An Efficient and Privacy-Aware Augmented Reality Framework for Indoor Location-Based Services(IROS 2022)
5. HDR-Like Image Generation to Mitigate Adverse Wound Illumination Using Deep Bi-directional Retinex and Exposure Fusion (Medical Image Understanding and Analysis 2021)
6. A Survey of IoT Applications in Blockchain Systems: Architecture, Consensus and Traffic Modeling(ACM Computing Surveys 2020)
7. Trunk Volume Prediction of Individual Populus *euphratica* Trees Based on Point Clouds Analysis (SCI, Journal of Ecological Indicators 2018)
8. Ensemble smartphone indoor localization algorithm based on wireless signal and image analysis (EI, Journal of Computer Application 2018)
9. Low-Cost 3D Personalized Chocolate Printing Platform (EI, Journal of Computer-aided Design and Computer Graphics 2015)

PATENTS AND COPYRIGHTS

1. A Process of Identifying Bugs in the Source Code (Patent ID: 81975998)
2. Mobile Terminal 3D Scanning Image Acquisition and Processing on Single Tree Trunks
3. Display Methods, Devices and Terminal Equipment for Augmented Reality of Indoor Environments
4. IoT Lights Control System Based on Virtual Reality and Skeleton Tracking(2014SR131,043)
5. Android Virtual House Roaming Display System Based on Unity3D(2014SR131,041)
6. Advanced Capture System Based on Two Kinect Devices (2013SR161400)
7. Home entertainment equipment based on Unity3D and Arduino platform(2014SR131,048)

PEER REVIEW EXPERIENCES

1. Expert Systems with Applications (2 Reviews)
2. Engineering Applications of Artificial Intelligence (3 Reviews)
3. Globecom 2017 CISS (7 Reviews)
4. ACM CHI conference on Human Factors (4 Reviews)
5. European Conference on Information Systems 2025 (2 Reviews)
6. The 34th International Joint Conference on Artificial Intelligence (3 Reviews)
7. International Joint Conference on Neural Networks 2025 (3 Reviews)
8. International Conference on Learning Representations 2025 (In Progress)
9. Medical Imaging with Deep Learning 2025 (3 Reviews)

ACCOMPLISHED COURSES (PARTIAL)

1. CS 541 Deep Learning (Worcester Polytechnic Institute)
2. CS 534 Artificial Intelligence (Worcester Polytechnic Institute)
3. CS 586 Big Data Analytics (Worcester Polytechnic Institute)
4. CS 543 Computer Graphics (Worcester Polytechnic Institute)
5. CS 525 Special Topic: Reinforcement Learning (Worcester Polytechnic Institute)
6. CS 6476: Computer Vision (Georgia Institute of Technology)
7. CS 7637: Knowledge-Based Artificial Intelligence (Georgia Institute of Technology)
8. DSC 381 Probability & Inference (The University of Texas at Austin)
9. DSC 382 Regression & Predictive Modeling (The University of Texas at Austin)
10. DSC 384 Design Principles & Causal Inference (The University of Texas at Austin)
11. MITx: 6.041 Probability - The Science of Uncertainty and Data (Massachusetts Institute of Technology)
12. MITx: 6.86 Machine Learning with Python-From Linear Models to Deep Learning (Massachusetts Institute of Technology)
13. ML 326 Natural Language Processing (The University of Texas at Austin)

HONOR AND REWARDS

1. Dell ISG Hackathon 2022 Regional Finalist: Innovating How We Work (Dell Technology) 2022
2. Dell ISG Hackathon 2021 Global Winner: Innovating How We Work (Dell Technology) 2021
3. Outstanding Student Scholarship (Chinese Academy of Sciences) 2018
4. Scientific and Technological Innovation Scholarship (Twice) 2015
5. 1st Prize, “China Software” National Competition 2014
6. 1st Prize, Intel International Embedded System Design(ESDC) 2014
7. 2nd Prize, Jiangsu Province Physics Innovation Competition 2014
8. 2nd Prize, Jiangsu Province Internet of Things Application Competition 2014