Max Zuo

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Education

BROWN UNIVERSITY — **Providence, RI**
Ph.D. Program in Computer Science, focusing on Weakly-Supervised Learning. *Ph.D.: Aug '23 –*

GEORGIA INSTITUTE OF TECHNOLOGY — **Atlanta, GA**
College of Computing *BS: Aug '18 – May '21*
GPA: 4.00 / 4.00

- MS in Computer Science with a specialization in Machine Learning
- Relevant courses: *OOP, Data Structures & Algorithms, Artificial Intelligence, Machine Learning, Probability & Statistics, Combinatorics, Networking, Algorithms Honors, Computer Vision, NLP, Machine Learning Theory, Interactive Robot Learning, Human Machine Learning, Deep Learning, Cognitive Science*

MS: Aug '21 – Dec '22
GPA: 4.00 / 4.00

Publications

Unifying exemplar and prototype models of categorization. [Accepted poster presentation] 2023
Zuo, M., Marupudi, V., & Varma, S. (2023). *Proceedings of the 45th Annual Cognitive Science Society Conference, Sydney, Australia.*

ConSOR: A Context-Aware Semantic Object Rearrangement Framework for Partially Arranged Scenes 2023
Ramachandruni, K., **Zuo M.**, & Chernova S. (2023). *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems.*

ATCON: Attention Consistency for Vision Models 2022
Mirzazadeh, A., Dubost, F., Pike, M., Maniar, K., **Zuo, M.**, Lee-Messer, C., & Rubin, D. (2022). *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (pp. 1880-1889).*

Efficient Exploration via First-Person Behavior Cloning Assisted Rapidly-Exploring Random Trees 2022
Zuo, M., Schick, L., Gombolay, M., & Gopalan, N. (2022). *HRI 2022 Workshop - MLHRC.*

Work Experience

GOOGLE — **MTV, CA**

Software Engineering Intern *May '23 – Sep '23*
Developed new OCR algorithm f for Google StreetView images using Tensorflow on the **Google Geo** StreetSmart with linearized attention and ultra-lightweight feature extractors.

- 20% faster with 10% fewer errors
- 30% fewer errors at peak performance
- 15% fewer errors at the same speed

Software Engineering Intern *May '22 – Aug '22*
Worked on the machine learning research teams **Tensorflow Model Garden** & **Tensorflow Vision** under CoreML to code, train, and improve open-vocabulary object detection models.

- Implemented the **ViLD** object detection framework.

Presented papers and proposed projects on state-of-the-art works.

- Proposed projects on **CMT-Deeplab**, ***k*Means Mask Transformer**.

GEORGIA INSTITUTE OF TECHNOLOGY — **Atlanta, GA**

Graduate Researcher (AI/ML & Robotics) *Aug '21 – May '23*
Conducting research under Prof. Sonia Chernova on semantic rearrangement: the ability for a robot/planner to organize a scene without explicit detailed human instruction.

- Working with PDDLStream, Graph NNs, and pose graphs.

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Graduate Researcher (Computer Vision & Unsupervised Learning) *Aug '20 – May '23*

Conducting research under Prof. Thad Starner on AI Through Symbiosis (wearable technology, unsupervised learning) specializing in computer vision and SLAM.

- Developed a new HMM-based algorithm, utilizing its model capacity to recover event labels in a weakly supervised manner, used to train deep vision and time-series models.

Graduate Teaching Assistant *Aug '21 – Dec '21*

TA/Head TA of the *Mobile & Ubiquitous Computing* course (i.e. wearables, HCI). Focused on teaching applied research methods, conducting user studies, and prototyping. *Jan '22 – May '22* ***(HEAD TA)***

Undergraduate Teaching Assistant *Jan '20 – May '20*

Lead teaching assistant for *Machine Learning* (CS 4641), a fourth-year level course.

OCULOGYX (OX) — Bentonville, AR

Research Engineer *May '21 – Sep '21*

- Leading the development of mapping warehouse floors with SKU-level info to ~1m accuracy.
- Involved in business decisions with the CTO and CEO of the company.
- Worked on developing **Ox Orion**, a near real-time computer vision recognition for groceries.
  - Deep learning one-stage one-shot object detection.
  - Pipelined algorithm using SIFT features, RANSAC homography, and triplet loss for object recognition and geometric verification.
- Developed **Ox Automapper** product from scratch, a pedestrian GraphSLAM algorithm mapping warehouse and supermarket store floors with SKU-level information.
  - GraphSLAM for pedestrian data using inertial (IMU) odometry.
  - Deep learning sensor correction and sensor fusion for natural pedestrian walk routines.

IBM — Littleton, MA

Software Engineering Intern *Jun '20 – Aug '20*

Worked on IBM Food Trust Blockchain Transparent Supply, significantly expanded open-source Recall Assistant capabilities.

- Worked directly with customers to support complex, real recall scenario types.
- Used by customers including Walmart for faster, more accurate recall assistance.

Developed IBM cloud solutions for improving the internal production pipeline.

Awards & Achievements

GVU Distinguished Masters' Finalist '22
HackGT '21 – First place overall & best design
GT Highest Honors '21 – 4.00 GPA for BS in CS
GT Sports Innovation '20 – Winner, computer vision football analysis
HackGT '19– NSA: Secure Code Challenge Winner
MIT Blueprint 2017 – First place

Personal Projects

All: github.com/maxzuo

Hypercut (HackGT, Oct 2021) – Video summary generator

Using sentence transformers MPNet and TextRank to reduce the content of a video while maintaining as much pertinent information as possible.

- Wav2Vec2 + CTC for offline transcription, Google Cloud Speech API for online transcription

Datalytics (GT Sports Innovation, Mar 2020) – Computer vision tool to automatically analyze football footage

- Yard line extraction, score information extraction, team formation extraction, and action segmentation

Skills

Software Development	Python, Java, Go, C, SQL, JavaScript, TypeScript, HTML, CSS
Libraries	OpenCV, NumPy, Keras, Tensorflow, PyTorch, Scikit-Learn Firebase, React, Flask, JQuery
Machine Learning	Computer vision, Object detection, Few/one-shot learning, Open-vocabulary detection, Convolutional Neural Networks, Graph Neural Networks, Transformers, HMMs, Autoencoders, SVM, Random Forests, Word2Vec, LSTM, Text/PageRank
Robotics	SLAM, Planning (PDDL/PDDLStream), Scene graphs, Learning from demonstrations, Inverse reinforcement learning
Foreign Languages	Fluent Mandarin, Spanish (National Spanish Exam 3 Bronze, NSE2 Silver)
Misc	JSON, Git, VSTS, Agile, Jenkins, IBM Cloud

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