Max Zuo

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Education

BROWN UNIVERSITY — **Providence, GA**
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: Aug '21 – Dec '22 **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*

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*
Developing OCR techniques for Google StreetView images at Scale using Tensorflow on the **Google Geo** StreetSmart organization. Conducting research on:

- Novel limited supervision techniques for object detection (WSOD).
- Novel techniques to convert image classifiers into object detection models.

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 '22*
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.

Graduate Researcher (Computer Vision & Unsupervised Learning) *Aug '20 – May '22*

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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, and team formation extraction
- Action segmentation (detects start and end of plays)

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

United States Citizen