

Thomas Manzini

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EDUCATION

Texas A&M University, College Station, TX

PhD - ML & Robotics for Disaster Response, Dr. Robin Murphy, In Progress

Honors: Graduate Research Fellowship - Awarded full tuition coverage & monthly stipend (2022 - present)
Graduate Student Leadership Award (2022)

Carnegie Mellon University, Pittsburgh, PA

MS – Master of Language Technologies, 2018

Honors: Graduate Research Fellowship - Awarded full tuition coverage & monthly stipend (2016 - 2018)

Rensselaer Polytechnic Institute, Troy, NY

BS, Computer Science, *Cum Laude*, 2016

Honors: Stanley I. Landgraff '46 Award - Excellence in leadership and academic achievement (2016)
President - Upsilon Pi Epsilon Computer Science Honor Society (2014 - 2016)
Phalanx Senior Leadership Honor Society (2015 - 2016)
Dean's List (2012, 2013, 2014, 2015, 2016)
Rensselaer Leadership Award & Scholarship (2012 - 2016)

PUBLICATIONS

- Manzini**, Murphy, Merrick “Quantitative Data Analysis: CRASAR Small Unmanned Aerial Systems at Hurricane Ian” *SSRR '23*. Proceedings of the 2023 IEEE International Conference on Safety, Security, and Rescue Robotics. November 2023. **(Accepted – In Press)**
- Murphy, **Manzini** “Improving Drone Imagery For Computer Vision/Machine Learning in Wilderness Search and Rescue” *SSRR '23*. Proceedings of the 2023 IEEE International Conference on Safety, Security, and Rescue Robotics. November 2023. **(Accepted – In Press)**
- Manzini**, Murphy, “Open Problems in Computer Vision for Wilderness SAR and The Search for Patricia Wu-Murad” *ICCV 2023 Workshop on AI for Humanitarian Assistance and Disaster Response*. October 2023. **(Poster)**
- Manzini**, Murphy, Merrick, Adams “Wireless Network Demands of Data Products from Small Uncrewed Aerial Systems at Hurricane Ian”. *ROS '23*. Proceedings of the 2023 IEEE International Conference on Intelligent Robots & Systems. October 2023. **(Oral)**
- Smith, Mukhopadhyay, Murphy, **Manzini**, Rodriguez “Path Coverage Optimization for USV with Side Scan Sonar for Victim Recovery”. *SSRR '22*. Proceedings of the 2022 IEEE International Conference on Safety, Security, and Rescue Robotics. November 2022. **(Oral)**
- Manzini**, Shao, Mantravadi, Buendia, Knoertzer, et al. “Examination and Extension of Strategies for Improving Personalized Language Modeling via Interpolation” Proceedings of the 58th conference of the Association of Computational Linguistics, Workshop on Natural Language Interfaces. July 2020. **(Oral)**
- Manzini** & Lim, et al. “Black is to Criminal as Caucasian is to Police: Detecting, Evaluating and Removing Multi-Class Bias in Word Embeddings”. *NAACL '19*. Proceedings of the North American Chapter of the Association for Computational Linguistics. June 2019. **(Oral)**
- Pham, Liang, **Manzini**, et al. “Found in Translation: Learning Robust Joint Representations by Cyclic Translations Between Modalities”. *AAAI '19*. Proceedings of the 33rd conference of the Association for the Advancement of Artificial Intelligence. February 2019. **(Poster)**
- Pham, Liang, **Manzini**, et al. “Learning Robust Joint Representations for Multimodal Sentiment Analysis”. *NeurIPS 2018 Workshop on Interpretability and Robustness in Audio, Speech & Language*. December 2018. **(Oral)**
- Manzini**, Chandu & Singh. “Language Informed Modeling of Code-Switched Text”. *ACL '18*. Proceedings of the 56th conference of the Association of Computational Linguistics, Workshop on Computational Approaches to Linguistic Code-switching. July 2018. **(Poster)**
- Manzini** & Pham, et al. “Seq2Seq2Sentiment: Multimodal Sequence to Sequence Models for Sentiment Analysis”. *ACL '18*. Proceedings of the 56th conference of the Association of Computational Linguistics, Workshop on Human Multimodal Language. July 2018. **(Oral)**
- Manzini** et al. “Toward Improving the Intelligibility of Black-Box Speech Synthesizers in Noise”. *SPECOM '18*. Proceedings of the 20th conference on Speech and Computer. September 2018. **(Oral)**
- Prabhumoye, Botros, Chandu, Choudhary, Keni, Malaviya, **Manzini** et al. “Building CMU Magnus from User Feedback”. *Alexa Prize '17*. In *AWS re:INVENT 2017*. Nov 2017. **(Paper)**
- Manzini** & Ravichander et al. “How Would You Say It? Eliciting Lexically Diverse Dialogue for Supervised Semantic Parsing”. *SIGdial '17*. Proceedings of the 18th SIGdial Conference. August 2017. **(Poster)**
- Manzini** et al. “A Play on Words: Using Cognitive Computing as a Basis for AI Solvers in Word Puzzles”. *Journal of Artificial General Intelligence*. Volume 6, Issue 1, Pages 111–129, December 2015. **(Paper)**

ARTICLES & TECHNICAL REPORTS

Manzini, Murphy, Heim, Robinson, Zarrella, Gupta. “Harnessing AI and Robotics in Humanitarian Assistance and Disaster Response”. Science Robotics. July 2023.

Manzini & McLeod. “Asynchronous Evolutionary Neural Architecture Search”. Microsoft MLADS Spring ‘19. June 2019. Microsoft Internal Publication.

EMPLOYMENT

Microsoft, Cambridge, MA

Machine Learning Scientist II – Office Docs (Spring 2020 - Spring 2022)

- Led development and deployment of production ML models for change summarization in word documents across a team of multiple engineers and scientists.
- Oversaw privacy standards and compliance for new features for the Office Docs Team.
- Developed ML tools and infrastructure to support collaboration features in Microsoft Office.

Machine Learning Scientist – Office Docs (Spring 2020)

- Led machine learning infrastructure and modeling efforts for a team of multiple engineers and scientists working on summarizing changes in word documents.
- Developed, deployed, and evaluated crowdsourcing pipelines for multiple data annotation tasks.

Software Engineer, Microsoft AI Development Acceleration Program (2018 - 2020)

- Developed infrastructure for training personalized language models for users in Microsoft Outlook.
- Trained deep multimodal neural models for user and task modeling in Microsoft Office.
- Devised and deployed novel Neural Architecture Search methods for deep learning models.

Pinterest, San Francisco, CA

Intern – Software Engineer, Ads Ranking/Billing Team (summer 2016)

LinkedIn, Mountain View, CA

Intern – Software Engineer, Digits – Growth and Lifecycle Team (summer 2015)

Bloomberg L.P., New York, NY

Consultant – Software Engineer, Fixed Income Search Team (fall 2014 - spring 2015)

Intern – Software Engineer, Fixed Income Search Team (summer 2014)

Hover Inc., Los Altos, CA

Intern – Software Engineer (summer 2013)

MGM Resorts International, Las Vegas, NV

Intern – Software Engineer, Multi-Media Department (summer 2012)

Microsoft Innovation Center/Linq360, Las Vegas, NV

Intern – Information Technology Department (summer 2011)

NOTABLE TECHNOLOGY PROJECTS

Hurricane Damage Detection in sUAS Imagery – Texas A&M University (2023 – present)

- Leading the development and curation of a multitask dataset of sUAS overhead imagery.
- Driving collaboration across academic and governmental organizations to ensure operational alignment so to ease the eventual transition of any downstream ML models into practice.

Center for Robot Assisted Search and Rescue - Wilderness Search and Rescue, Texas A&M University (2023)

- Led the development of novel computer vision systems for wilderness search and rescue.
- Validated the efficacy of multiple computer vision systems in real-world missing persons search.

World Health Organization COVID-19 - Hospital Readiness Monitoring, Microsoft Disaster Response (2021)

- Developed data management platform for the WHO to monitor hospital readiness.

Centers For Disease Control COVID-19 - School Closure Detection, Microsoft Disaster Response (2020)

- Led machine learning modeling efforts to automatically detect school closure announcements to support public health monitoring.
- Developed training materials and instructed operators on how to interpret model outputs.

Centers For Disease Control COVID-19 - Health Statistics Collection, Microsoft Disaster Response (2020)

- Led technical efforts developing an automated information extraction system to collect statistics and information to support the CDC's COVID-19 task force.
- Model outputs were included as part of the CDC's daily brief in the first weeks of the pandemic.
- Deployed system received daily use during the COVID-19 pandemic.

OPERATIONAL EXPERIENCE

Hurricane Ian (FL-UAS1), Fort Myers, FL (Sep-Oct 2022)

Deployed to Fort Myers Florida in support of operations in response to Hurricane Ian.
Directly supported over 30 remote sensing, mapping, and situational awareness missions.

Newton Fire Department, Newton, NH (2021-2022)

Respond to 911 calls in the town of Newton NH including fire and medical incidents.

Edgewood Fire Department, Pittsburgh, PA (2017-2018)

Respond to 911 calls in the Edgewood borough of Pittsburgh including fire, medical, & HazMat incidents.

Carnegie Mellon University Emergency Medical Services, Pittsburgh, PA (2016-present)

Respond to medical emergency calls throughout the CMU Campus and the surrounding area.

Rensselaer Polytechnic Institute Ambulance, Troy, NY (2012-2016)

Positions Held: Captain (Elected 2014-2016), Training Committee Chair (2014), Scheduling Coordinator (2012)
Ranks achieved: Crew Chief (Trainer), Driver (Trainer), Event EMS Supervisor, Duty Supervisor, EMT-B
Supervised daily EMS response for the entire RPI Campus & Mutual Aid Service to surrounding communities.
Supervised EMS response for numerous sporting, music, & community events with attendances >1000.

ACADEMIC SERVICE

Organizer, 6th Humanitarian Assistance and Disaster Response for AI Workshop at NeurIPS'23 (Fall 2023)

Organizer, 5th Humanitarian Assistance and Disaster Response for AI Workshop at ICCV'23 (Fall 2023)

Organizer, 4th Humanitarian Assistance and Disaster Response for AI Workshop at NeurIPS'22 (Fall 2022)

Reviewer, Natural Language Processing for Personal Impact at ACL'21 (Spring 2021)

Member, CMU Masters Experience Council – School of Computer Science (2017 - 2018)

Member, CMU Dean's Masters Advisory Council – School of Computer Science (2016 - 2018)

Co-Founder, RPI Science Undergraduate Council (2015 - 2016)

President, Upsilon Pi Epsilon Computer Science Honor Society, New York Eta Chapter (2015 - 2016)

CERTIFICATIONS, LICENSES & SHORT COURSES

Aviation

FAA Commercial Pilot, Part 61 (2022 - ongoing)

Airplane Single Engine Land (ASEL)

Instrument Rated

Endorsements: Spins, Complex, High Performance

FAA sUAS Pilot, Part 107 (2022 - ongoing)

Emergency Medicine

National Registry Advanced Emergency Medical Technician – NRAEMT (2020-2023)

AHA CPR – Basic Life Support for Healthcare Providers (2012 - 2023)

All Hazards Response

Fire Fighter 1 Pro-Board, NFPA 1001, Certification (2017 - ongoing)

Hazardous Materials Technician Pro-Board, NFPA 1072, Certification (2022 - ongoing)

NAUI SCUBA Diver (2018 - ongoing)

Rescue Diver, Advanced Open Water Diver, NITROX

TEACHING & INSTRUCTION

Microsoft New England Research and Development Center, Cambridge, MA

Microsoft AI Development Acceleration Program (2019) - *Onboarding Organizer FY20*

- Developed and managed onboarding curriculum for over 35 new hires involving machine learning, data science, and software engineering, and team organization topics.

Carnegie Mellon University, Pittsburgh, PA

Introduction to Deep Learning (2018) - *Graduate Teaching Assistant*

- Provided multiple guest lectures on various topics related to deep learning.
- Mentored numerous student projects (of which some resulted in publications).

Rensselaer Polytechnic Institute, Troy, NY

RPI Science Ambassadors (2013 - 2016) - *Science Ambassador*

- Traveled to local area middle and high schools giving hands on presentations on STEM topics.

Introduction to Computer Science (2016) - *Undergraduate Teaching Assistant*

Introduction to Algorithms (2013 - 2014) - *Undergraduate Teaching Assistant*

Introduction to Open-Source Software (2015 - 2016) - *Undergraduate Teaching Assistant*

LANGUAGES & SOFTWARE

Languages:

Human: English (Native), Spanish (Basic working proficiency)

Computer: Python, Cython, Scope, C#, SQL, Java, Typescript, C++, C, Matlab, Javascript, HTML, CSS

Software:

Machine Learning: PyTorch, Keras, Tensorflow, Horovod, Parasail, Scikit-Learn, PyBrain

Distributed Computing: MPI, mpi4py, Apache Hadoop, Apache Spark, Apache Hive, Apache Pig

Software Development: Git, Visual Studio, IntelliJ, Azure Devops, Atlassian Jira

Publishing: LATEX, Overleaf, ShareTex, Adobe Photoshop, GIMP, Adobe Lightroom, DxO Nik Collection

Documentation: Sphinx, JavaDocs