Thomas Manzini

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EDUCATION

Texas A&M University, College Station, TX
PhD, Computer Science, 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)

EMPLOYMENT

Microsoft, Cambridge, MA
Machine Learning Scientist II – Office Docs (Spring 2020 - Spring 2022)
- Led development and production deployment of 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)

PAPERS IN PROGRESS

Manzini, Perali, Karnik, Murphy. "CRASAR-U-DROIDs: A Large Scale Benchmark Dataset for Building Alignment and Damage Assessment in Georectified sUAS Imagery". **(Under Review – Nature Scientific Reports)**

Manzini, Perali, Murphy. "Looks Can Be Deceiving: Annotator and Reviewer Performance Across Imagery Scales In Aerial Damage Assessment". **(Under Review – WACV'26)**

Manzini, Perali, Karnik, Murphy. "A Benchmark Dataset and Baseline Models for Spatially Aligned Road Damage Assessment in Small Uncrewed Aerial Systems Disaster Imagery". **(Under Review – AAAI'26)**

Manzini, Perali, Murphy. "Deploying Rapid Damage Assessments from sUAS Imagery for Disaster Response". **(Under Review – IAAI'26)**

PEER REVIEWED PUBLICATIONS

P21) **Manzini**, Perali, Karnik, Godbole, Abdullah, Murphy. "Challenges and Research Directions from the Operational Use of a Machine Learning Damage Assessment System via Small Uncrewed Aerial Systems at Hurricanes Debby and Helene". Proceedings of the 2025 IEEE International Conference on Robot and Human Interactive Communication. *RO-MAN '25.* August 2025. **(Accepted – In Press)**

P20) **Manzini**, Perali, Karnik, Godbole, Abdullah, Murphy. "Non-Uniform Spatial Alignment Errors in sUAS Imagery From Wide-Area Disasters". Proceedings of the 2025 IEEE International Conference on Robot and Human Interactive Communication. *RO-MAN '25*. August 2025. **(Accepted – In Press)**

P19) **Manzini**, Perali, Murphy. "Now You See It, Now You Don't: Damage Label Agreement in Drone & Satellite Post-Disaster Imagery". Proceedings of the 2025 ACM Conference on Fairness, Accountability, and Transparency. *FAccT '25*. June 2025. **(Oral)**

P18) Murphy, **Manzini**, Peres. "Analysis of Human Errors in Small Uncrewed Aerial Systems Used During Hurricane Ian" *SSRR '24*. Proceedings of the 2023 IEEE International Conference on Safety, Security, and Rescue Robotics. December 2024. **(Oral)**

P17) **Manzini**, Murphy "Differentiable Boustrophedon Paths That Enable Optimization Via Gradient Descent" *ICRA'24*. Proceedings of the 2023 IEEE International Conference on Robotics and Automation. May 2024. **(Poster)**

P16) **Manzini,** Perali, Murphy "Three challenges in Utilizing Machine Learning to Predict Human Behavior from Observational Data". Conference on Human Robot Interaction (HRI'24), Late Breaking Report. March 2024. **(Poster)**

P15) **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. **(Oral)**

P14) 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. **(Oral)**

P13) **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)**

P12) **Manzini**, Murphy, Merrick, Adams "Wireless Network Demands of Data Products from Small Uncrewed Aerial Systems at Hurricane Ian". *IROS '23*. Proceedings of the 2023 IEEE International Conference on Intelligent Robots & Systems. October 2023. **(Oral)**

P11) 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)**

P10) **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)***

P9) **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)**

P8) 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)**

P7) 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)**

P6) **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)***

P5) **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)***

P4) **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)***

P3) 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)***

P2) **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)***

P1) **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

A3) Murphy, **Manzini**. “Why Drones and AI Can’t Quickly Find Missing Flood Victims, Yet”. The Conversation. July 2025.
A2) **Manzini**, Murphy, Heim, Robinson, Zarrella, Gupta. “Harnessing AI and Robotics in Humanitarian Assistance and Disaster Response”. Science Robotics. July 2023.
A1) **Manzini** & McLeod. “Asynchronous Evolutionary Neural Architecture Search”. Microsoft MLADS Spring ‘19. June 2019. Microsoft Internal Publication.

NOTABLE TECHNOLOGY PROJECTS

Automated Damage Assessment 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 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.
- Deployed system received regular use during the COVID-19 pandemic.

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.

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, Transportation Research Board (2025)
Reviewer, ACM SIGCHI Computer Supported Cognitive Work (2025)
Reviewer, Winter Applications Conference on Computer Vision (2025)
Reviewer, Symposium on Safety, Security and Rescue Robotics (2023)
Reviewer, Association for the Advancement of AI - Artificial Intelligence for Social Impact (2024, 2025)
Reviewer, International Conference on Machine Learning (ICML) Workshops (2024, 2025)
Reviewer, Natural Language Processing for Personal Impact at ACL’21 (Spring 2021)

Member, CMU Master’s Experience Council – School of Computer Science (2017 - 2018)
Member, CMU Dean’s Master’s 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)

TEACHING & INSTRUCTION

Florida State University, Tallahassee, FL
CLARKE Damage Assessment System Operational Training (2025) – Co-Organizer & Lead Instructor
- Developed and presented operational training for deploying and interpreting the CLARKE automated building and road damage assessment system to 91 emergency management & response personnel.

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 11-785 (2018) - *Graduate Teaching Assistant*
- Provided numerous guest lectures and recitations on various topics related to deep learning.
- Managed grading for all 173 students.

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*

SELECT AND INVITED TALKS

Thomas Manzini, Dr. Robin R. Murphy; "How to Fly For AI: How To Collect Aerial Imagery for Use With Artificial Intelligence Systems In Public Safety" AUVSI'25, May 2025

Invited Speaker – Harvard University, Heat Simulation and Data Preparedness Workshop (September 2025)
Invited Speaker – Florida State University, Emergency Management and Homeland Security (April 2025)
Invited Speaker – MIT Lincoln Laboratory HADR Group (August 2024)
Invited Seminar Speaker – Military Operations Research Society (September 2024)
Invited Seminar Speaker – NSF AI Institute for Societal Decision Making Seminar Series (October 2024)
Invited Seminar Speaker – CMU LTI Data Science Seminar Series (October 2017)

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 (2016-2018)
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.

MEDIA APPEARANCES

Interview - KHOU News – September 2025
Interview - KBTX News 3 – July 2025
Interview - The Weather Channel – June 2025
Interview - The Weather Geeks Podcast – November 2024

CERTIFICATIONS, LICENSES & SHORT COURSES

Aviation
FAA Commercial Pilot, Part 61 (2022 - ongoing)
Ratings: Airplane Single Engine Land (ASEL), Airplane Multi Engine Land (AMEL), Instrument
Endorsements: Spins, Complex, High Performance
FAA sUAS Pilot, Part 107 (2022 - ongoing)

Emergency Medicine
National Registry Advanced Emergency Medical Technician – NR-AEMT (2020-2027)
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, Drysuit

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