# Rangel Daroya

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## EDUCATION

**University of Massachusetts**, Amherst, MA, USA
Ph.D. Computer Science (GPA: 4.00/4.00), September 2022 – September 2027 (expected)

- Exploring and understanding relationships between computer vision tasks, including multi-task and transfer learning, to effectively solve computer vision problems in multi-modal applications (e.g., involving text, images).
- Developing improved data representations and embeddings to drive robust, generalizable models for large-scale real-world applications in environmental and scientific domains. [*Advisor: Subhransu Maji*]

**University of the Philippines**, Quezon City, Philippines
M.S. Electrical Engineering (GPA: 3.95/4.00), January 18 – July 2020

- Focused on 3D reconstruction of objects and buildings (Thesis: *"REIN: Flexible mesh generation from point clouds"* [paper])

B.S. Electronics and Communications Engineering (GPA: 3.89/4.00), June 2012 – June 2017

- Project: *"NDVI image extraction of an agricultural land using an autonomous quadcopter with a filter-modified camera"* [paper]
- Summa Cum Laude & Top 2 in the entire university with 3,000+ students.

## PUBLICATIONS (Google Scholar)

1. **SuperRivolution: Fine-Scale Rivers from Coarse Temporal Satellite Imagery**
   Rangel Daroya, Subhransu Maji. *IEEE/CVF Winter Conference on Applications of Computer Vision (WACV),* 2026. (to appear)
2. **RiverScope: High-Resolution River Masking Dataset** [paper]
   Rangel Daroya, Taylor Rowley, Jonathan Flores, Elisa Friedmann, Fiona Bennitt, Heejin An, Travis Simmons, Marissa Jean Hughes, Camryn L Kluetmeier, Solomon Kica, J Daniel Vélez, Sarah E Esenther, Thomas E Howard, Yanqi Ye, Audrey Turcotte, Colin Gleason, Subhransu Maji. *Association for the Advancement of Artificial Intelligence (AAAI)*, 2026. (to appear)
3. **WildSAT: Learning Satellite Image Representations from Wildlife Observations** [paper], Spotlight Talk at CV4E (ICCVW)
   Rangel Daroya, Elijah Cole, Oisin Mac Aodha, Grant Van Horn, Subhransu Maji. *IEEE/CVF International Conference on Computer Vision (ICCV)*, 2025.
4. **Improving Satellite Imagery Masking using Multi-task and Transfer Learning** [paper]
   Rangel Daroya, Luisa Vieira Lucchese, Travis Simmons, Punwath Prum, Tamlin Pavelsky, John Gardner, Colin Gleason, Subhransu Maji. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing (JSTARS)*, 2025.
5. **T-SAM: Transductive Learning for Segment Anything Model** [paper]
   Rangel Daroya, Deepak Chandran, Subhransu Maji, Andrea Fanelli. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2025.
6. **Task2Box: Box Embeddings for Modeling Asymmetric Task Relationships** [paper], Highlight (11.9% of accepted papers)
   Rangel Daroya, Aaron Sun, Subhransu Maji. *IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2024.
7. **COSE: A consistency-sensitivity metric for saliency on image classification** [paper]
   Rangel Daroya*, Aaron Sun*, Subhransu Maji. *IEEE/CVF International Conference on Computer Vision Workshops (ICCVW)*, 2023.
8. **REIN: Flexible mesh generation from point clouds** [paper]
   Rangel Daroya, Rowel Atienza, Rhandley Cajote. *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, 2020.
9. **Alphabet sign language image classification using deep learning** [paper]
   Rangel Daroya, Daryl Peralta, Prospero Naval. *IEEE Region 10 Conference (TENCON)*, 2018.
10. **NDVI image extraction of an agricultural land using an autonomous quadcopter with a filter-modified camera** [paper]
    Rangel Daroya, Manuel Ramos. *IEEE International Conference on Control System, Computing and Engineering (ICCSCE)*, 2017.

## WORK EXPERIENCE

**University of Massachusetts**, Amherst, MA, USA
Research Assistant, September 2022 – Present

- Developing multispectral satellite data representations using ML and computer vision to model water quality and sediment movements in Earth's rivers. This project resulted in a global model of all rivers for hydrological applications, and will be deployed to NASA PO.DAAC, an open-source data archive that collects, preserves, and provides access to ocean and climate data.

**AngioInsight**, Minnetonka, MN, USA
Engineering Intern (Part-time), June 2025 – August 2025

- Explored and implemented spatiotemporally dynamic segmentation algorithms for angiograms in medical applications.

**Dolby Laboratories**, San Francisco, CA, USA
Ph.D. Research Intern, May 2024 – August 2024

- Collaborated Dr. Andrea Fanelli and Deepak Chandran on exploring task representations to improve performance and data efficiency of machine learning models. Resulted in a published paper in CVPRW 2025.

**Thinking Machines Data Science**, Taguig, Philippines [https://thinkingmachin.es/]
Team Lead & Machine Learning Researcher, February 2020 – January 2022

- Created and delivered a model for predicting facility utilization of a telecommunications company with >80% accuracy. This resulted in a signed project worth $1-2 million.
- Developed cloud-based web/data analytics applications by performing backend (primary) and DevOps roles for an investment firm with >$300 billion in assets under management. Developed primarily using Python, FastAPI, Red Hat OpenShift, Amazon Elastic Kubernetes Service, Elasticsearch, Kibana, Grafana, RedisGraph, PostgreSQL, Dagster, and CloudBees Jenkins.

**University of the Philippines**, Quezon City, Philippines
University Researcher III, May 2018 – January 2020

- Conducted research for a Philippine California Advanced Research Institutes (PCARI) project entitled *"AIRSCAN:* Collaborative *Aerial Robotics in Large-Scale Urban Infrastructure Management"* in collaboration with University of California Berkeley.
- Proposed and implemented algorithms for 3D reconstruction, resulting in greater than 80% improvement to the surface reconstruction approach compared to baseline classical algorithms. This also resulted in a research paper.
- Designed and executed a customized algorithm for 3D semantic building map augmentation and image object detection for industry partners. This work resulted in a patent.

## TEACHING EXPERIENCE

**University of the Philippines**, Quezon City, Philippines
Senior Lecturer, August 2021 – August 2022
Lecturer 2, January 2018 – July 2021

- Taught and organized undergraduate courses on circuit design, telecommunications, and MATLAB/Python programming.

**De La Salle University**, Manila, Philippines
Lecturer, March 2022 – August 2022

- Taught and organized undergraduate courses on energy conversion, AC/DC motor operation, and machine learning basics.

## HONORS AND AWARDS

- PhD Portfolio Distinction from University of Massachusetts, Amherst (2024)
  - Awarded to select PhD students meeting a high standard of completion, voted by faculty.
- Paul Utgoff Memorial Graduate Scholarship in Machine Learning from University of Massachusetts, Amherst (2023)
  - Competitive scholarship awarded to a first-year graduate student in Machine Learning.
- ICCV Travel Grant for Broadening Participation (2025)
- CVPR Travel Grant for inclusion (2024)
- Oblation Scholar at University of the Philippines (2012-2017)
  - Prestigious full scholarship given every year to the top 50 of 60,000+ university applicants in the Philippines.

## PATENT

- **Semantic Three-dimensional (3D) Building Augmentation,** PH12021050443 (2025). Inventors: Shakira Arguelles, Ferdinand John Briones, Izza Claire Jalandoni, Wonkyun Park, Jonric Mirando, James Carl Necio, Raimarc Dionido, Rowel Atienza, Soonyoung Lee, Rangel Daroya, Daryl Peralta.

## PROFESSIONAL ACTIVITIES

- Co-organizer of Machine Learning and Friends Lunch (MLFL) at University of Massachusetts, Amherst (2024 – present) [page]
  - MLFL is a weekly interactive forum at the university where we invite researchers to talk about their field of expertise
- Mentor, Early Research Scholars Program for undergraduate students at University of Massachusetts, Amherst (2024 – present)
- Ph.D. Application Reviewer at University of Massachusetts, Amherst (2023, 2024)
- Reviewer for IJCV 2024, ECCV 2024, CVPR 2025, ICCV 2025, NeurIPS 2025, AAAI 2026
- Mentor, GradMAP Philippines for STEM career mentorship (2022-2024) [page]

## SKILLS

- Programming Languages: Python, MATLAB, C/C++
- Machine Learning: PyTorch, PyTorch-lightning, Tensorflow, scikit-learn, NumPy, Pandas, SciPy
- Others: remote sensing, multispectral images, software environment management, shell scripting, High Performance Computing (HPC), multi-GPU training, Git, Docker, Latex, QGIS