

Isabelle Tingzon

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PROFESSIONAL EXPERIENCE

United Nations Children's Fund (UNICEF) | Giga Data Science Consultant

Barcelona, ESP
October 2023 - Present

- Leading our AI-enabled school mapping project, which leverages machine learning (ML), computer vision (CV), and high-resolution Maxar satellite images to advance SDG 4: Quality Education under Giga, a global initiative by UNICEF-ITU to connect every school to the internet by 2030. **Collaborators:** European Space Agency (ESA)
- Supervisors: Dr. Do-Hyung Kim, Dr. Ivan Dotu, and Naroa Zurutuza

The World Bank Group | Global Facility for Disaster Reduction and Recovery (GFDRR) Disaster and Climate Risk Data Fellow

Washington DC, USA
Feb 2023 - Present

- Led the development of deep learning models for the automated generation of critical housing stock information using high-resolution orthophotos, drone images, LiDAR data, and street view photos in support of government-led climate resilience programs in Caribbean small island developing states. **Collaborators:** Development Seed
- Conducted training on AI-assisted building delineation and roof classification for government staff, GIS practitioners, community mappers, and disaster responders as part of local capacity-building initiatives under the Digital Earth for Resilient Housing and Infrastructure Project. **Colab notebooks:** [Part 1](#) and [Part 2](#)
- Organized a workshop for World Bank consultants on (1) Intro to Machine Learning, (2) Intro to Deep Learning, (3) Intro to Computer Vision and Remote Sensing, and (4) Hands-on ML using Pytorch and Colab notebooks
- Supervisors: Pierre Chrzanowski, Dr. Nuala Margaret Cowan, and Dr. Andrea Garcia Tapia

AI4EO Future Lab | Technical University of Munich (TUM) Research Fellow, AI4EO Beyond Fellows Program

Munich, DEU
Aug 2022 - Jan 2023

- Investigated the applications of Geospatial ML for building attribute recognition and evaluated the cross-country generalizability of ML and CV models trained on urban form features vs. multispectral Sentinel-2 satellite images.
- Collaborated with TU Berlin and the Mercator Research Institute on Global Commons and Climate Change (MCC) on building type classification using the EUBUCCO dataset under the Generalizability & Transferability Working Group at the Chair of Data Science in Earth Observation at TUM.
- Supervisor: Prof. Xiaoxiang Zhu

Thinking Machines Data Science, Inc. GeoAI Team Lead and Machine Learning Researcher

Taguig City, PHL
Mar 2018 - Jul 2022

- Led a team of 7 ML researchers and engineers in developing our GeoAI product, which leverages ML/CV algorithms for building delineation & classification, land use & land cover classification, and socioeconomic class classification from high-resolution satellite images to support high-CAPEX decision-making by major telcos in Southeast Asia.
- Generated high-resolution poverty maps across the Philippines using ML/CV, demographic and health survey data, satellite imagery, social media data, and volunteered geographic information to support targeted humanitarian interventions led by UNDP Philippines and Zero Extreme Poverty 2030. **Collaborators:** UNICEF and QCRI.
- Accelerated the discovery of 300+ migrant settlements that emerged in Colombia during the Venezuelan mass migration crisis using ML and time-series Sentinel-2 satellite images, thereby improving the efficiency of humanitarian aid and response operations. **Collaborators:** iMMAP Colombia and Premise Data.
- Managed a team of 5 ML researchers - responsibilities included setting and monitoring team goals and having regular 1:1 meetings for coaching and mentoring; organized the GeoAI Bootcamp, an internal training program consisting of lectures, workshops, and hackathon events to accelerate upskilling of junior ML researchers.

Philippine-California Advanced Research Institutes (CHED-PCARI) Research Fellow II

Quezon City, PHL
Aug 2015 - Feb 2018

- Conducted research under the PCARI Project IIID 2013-054: Resilient Cyber-Physical Societal Scale Systems at the UPD Department of Computer Science, Computer Security Group; coordinated with a major water utility company for R&D of resilient cyber-physical infrastructure; developed a framework for finding optimal and resilient placements of hydraulic pressure sensors in water distribution networks using genetic algorithms (e.g. NSGA-II).

TECHNICAL SKILLS

- **Proficient:** Python, SQL, BigQuery, Jupyter, Pandas, NumPy, SciPy, NetworkX, Scikit-learn, Pytorch, Weights & Biases, QGIS, GDAL, GeoPandas, Rasterio, Google Earth Engine, Google Cloud Platform (GCP), Git, Asana
With experience: Docker, Dataflow, Apache Beam, AzureML, MapBox
- **Languages:** Filipino (native), English (fluent)

EDUCATION

Master of Science in Computer Science

Aug 2015 - Jan 2018

University of the Philippines Diliman
Grade: 1.15 (1.00 highest; 5.00 lowest)
PCARI Scholarship

Bachelor of Science in Computer Science

Jun 2011 - Jun 2015

University of the Philippines Diliman
Grade: 1.36 (1.00 highest; 5.00 lowest)
Magna Cum Laude
Phi Kappa Phi Honor Society

VOLUNTEER EXPERIENCE & COMMUNITY LEADERSHIP

Tutorials Co-lead | Climate Change AI - Core Team

2020 - Present

- Managing the CCAI tutorial series; co-organized the tutorials track at the Tackling Climate Change with Machine Learning Workshop at ICLR'24, NeurIPS'23, ICLR'23, NeurIPS'22, & NeurIPS'21, leading to the creation of 25+ tutorials

Tech Lead of AI/ML | Women Who Code Manila

2017 - Present

- Facilitated monthly study group sessions where members can learn about best practices in AI/ML
- Co-organized Filipinas in Tech 2022: Women in Data Science featuring leading Filipina data scientists in the industry and academia as speakers and panelists, focusing on career development and special topics.

Social Impact Mission | Identifying Social Needs in La Guajira, Colombia

May 8-12, 2019

- Conducted field visits in Bogota and La Guajira with UNICEF Colombia and iMMAP to assess the living conditions of Venezuelan migrants in informal settlements, leading to two USAID-funded AI for humanitarian action projects.

Academic Services | Reviewer/Meta-reviewer

- Journals:** Frontiers in Climate, Frontiers in Big Data - Data Analytics for Social Impact, Philippine Journal of Science (PJS), IEEE Latin America Transactions Special Issue on AI and Sustainability
- Conferences & Workshops:** Climate Informatics 2024, Tackling Climate Change with Machine Learning Workshop at ICLR'23, NeurIPS'22, & NeurIPS'21

PUBLICATIONS & PROCEEDINGS

- Doerksen, K.¹, **Tingzon, I.**¹, & Kim, D. (2024) "AI-powered school mapping and connectivity status prediction using Earth Observation." ICLR'24 Machine Learning for Remote Sensing Workshop. **Poster.**
- Tingzon, I.**, Cowan, N.M., & Chrzanowski, P. (2024) "Mapping housing stock characteristics from drone images for climate resilience in the Caribbean." NeurIPS'23 Workshop on Tackling Climate Change with Machine Learning. **Poster.** 13th International Conference on Climate Informatics. **Oral.**
- Tingzon, I.**, Cowan, N.M., & Chrzanowski, P. (2023) "Fusing VHR post-disaster aerial imagery and LiDAR data for roof classification in the Caribbean." In Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops, pp. 3740-3747. AI for Humanitarian Assistance and Disaster Response ICCV'23 Workshop. **Spotlight.**
- Tingzon, I.**, Miraflor, J.M., Zhu, X.X., & Kochupillai, M. (2023) "Towards impactful applications of AI4EO in the Global South." In 2023 Joint Urban Remote Sensing Event (JURSE), pp. 1-4. IEEE. International Future Lab AI4EO Symposium 2022. **Runner-up Best Poster.**
- Fatehikia, M., **Tingzon, I.**, Orden, A., Sy, S., Sekara, V., Garcia-Herranz, M., & Weber, I. (2020) "Mapping socioeconomic indicators using social media advertising data." EPJ Data Science, 9(1), 22.
- Ledesma, C., Garonita, O.L., Flores, L.J., **Tingzon, I.**, & Dalisay, D. (2020) "Interpretable poverty mapping using social media data, satellite images, and geospatial information." NeurIPS'20 Workshop on Machine Learning for the Developing World (ML4D). **Spotlight. Best Paper.**
- Dejito, N., Flores, R. A., De Guzman, R., **Tingzon, I.**, Carvajal, L., Aroca, A., & Delgado, C. (2021). Mapping access to water and sanitation in Colombia using publicly accessible satellite imagery, crowd-sourced geospatial information, and random forests. AI for Humanitarian Assistance and Disaster Response NeurIPS'20 Workshop. **Poster.**
- Tingzon, I.**, Dejito, N., Flores, R.A., De Guzman, R., Carvajal, L., Zapata Erazo, K., Contreras Cala, I.E., Villaveces, J. Rubio, D., & Ghani, R. "Mapping new informal settlements using machine learning and time-series satellite images: An application in the Venezuelan migration crisis." IEEE/ITU International Conference on Artificial Intelligence for Good (2020), KDD'20 Fragile Earth Workshop. **Spotlight. Best Paper. Best Presenter.**
- Tingzon, I.**, Orden, A., Sy, S., Sekara, V., Weber, I., Fatehikia, M., Garcia-Herranz, M. & Kim, D. (2019) "Mapping poverty in the Philippines using machine learning, satellite imagery, and crowd-sourced geospatial information." The International Archives of Photogrammetry, Remote Sensing, and Spatial Information Sciences, ICML'19 Workshop on AI for Social Good (AI4SG). **Poster.**

¹ equal contribution

TALKS & PRESENTATIONS

- **Mapping Housing Stock Characteristics from Drone Images for Climate Resilience in the Caribbean.** Climate Informatics 2024. 22 April 2024. Alan Turing Institute, BMA House, London, UK.
- **Applied Machine Learning Days (AMLD) Swiss Federal Institute of Technology Lausanne (EPFL).** Invited Panelist and Presenter for the tracks “Accelerating Climate Change Action Through Machine Learning” and “AI & Space – Algorithms for Socio-economic Benefits”. 25-26 March 2024. SwissTech Convention Center. Lausanne, Switzerland.
- **Building Climate Resilience in the Caribbean using AI, Drone Images, and Street View Photos.** Invited Speaker at the Columbia Climate School – Spring 2024. 20 March 2024. Columbia University, New York City, USA.
- **Mapping Housing Stock from Drone Images and Street View Photos for Climate Resilience in the Caribbean.** Lightning Talk at the American Geographical Society Fall Symposium, Geography 2050: The Changing Map of Risk, Hazards, & Finance. 16 November 2023. Columbia University, New York City, USA.
- **Generating Exposure Data Layers using AI & Earth Observation for Housing Resilience in the Caribbean.** Risk Data Library Workshop. 14 November 2023. The World Bank Headquarters at Washington DC, USA.
- **Tackling Climate Change with AI: From Energy to Agriculture to Disaster Response.** Co-presented with Priya Donti. 6th Indonesia's SDGs Annual Conference (SAC) 2023. 7 November 2023. Virtual.
- **Climate Change and Machine Learning: Opportunities, Challenges, and Considerations.** 9th Annual Public Policy Conference (APPC). 19 September 2023. Asian Institute of Management, Makati City, Philippines.
- **Harnessing Digital Innovation for Inclusive and Sustainable Risk Management.** Invited Panelist at the GFDRR Partnership Days 2023. 22 May 2023. The World Bank Headquarters at Washington DC, USA.
- **Towards Responsible and Impactful Applications of AI and Earth Observation.** DeepLearning.AI Pi & AI Event, Building Ethical AI Companions: Balancing Innovation with Responsible Design. 20 May 2023. Virtual
- **Identifying Ethical Issues in Earth Observation Research: Hands-on Tutorial with Case Studies.** Kochupillai, Mrinalini, Michael Schmitt, Simon Schneider, Conrad Albrecht, Matthias Häberle, Isabelle Tingzon. International Geoscience and Remote Sensing Symposium (IGARSS) 2023. Pasadena, California, USA.
- **Tutorial on Land Use and Land Cover (LULC) Classification using Pytorch and Google Earth Engine.** Climate Change AI Summer School 2022. 19 August 2022. Virtual. Colab Notebooks: [Part 1](#) and [Part 2](#)
- **Data Science for Social Good.** Code Filipina 2019. 26 October 2019. Asia Pacific College, Makati, Philippines; Youth for Women in Technology Iloilo Chapter WiTalks Webinar. 18 August 2021.
- **Research and Challenges of ML/AI against COVID-19 and Climate Change in the Context of Developing Countries.** Invited Panelist at Practical Machine Learning for Developing Countries Workshop ICLR 2021. 8 May 2021. Virtual.
- **Detecting Informal Settlements using Machine Learning, Satellite Images, and Mobile Apps.** Lightning Talk at the Geo for Good Summit 2020. 20-22 October 2020. Virtual.
- **Methodologies and Tools for Poverty Prediction.** Workshop on The Use of Big Data in Official Statistics for Measuring Digital Economy and Sustainable Development. 9 May 2019. National Administrative Department of Statistics (DANE), Bogota, Colombia.
- **Using Machine Learning and Satellite Images to Zero in on the Philippines' Most Vulnerable Communities.** Python Conference Asia Pacific (PyCon APAC) 2019. 24 February 2019. iAcademy, Makati, Philippines.
- **Shedding Light on Philippine Poverty.** AI for Social Good Workshop. 17-18 February 2019. Qatar Computing Research Institute, Hamad Bin Khalifa University. Ar-Rayyan, Qatar.