

Joshua Dimasaka

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Education

University of Cambridge, Department of Architecture

Cambridge, UK

PHD ARTIFICIAL INTELLIGENCE FOR THE STUDY OF ENVIRONMENTAL RISKS

Oct 2023 - Sep 2026 (Expected)

- Research: Global Disaster Risk Audit using Artificial Intelligence and Earth Observation Data
- Advisor: Dr. Emily So & Dr. Christian Geiss

University of Cambridge, Department of Earth Sciences

Cambridge, UK

MRES ENVIRONMENTAL DATA SCIENCE

Oct 2022 - Sep 2023

- Research: Near-real-time Country-wide Estimation of Susceptibility and Settlement Exposure from Norwegian Mass Movements via Inter-graph Representation Learning
- Advisor: Dr. Andrea Marinoni & Dr. Sivasakthy Selvakumaran

Stanford University, School of Humanities and Sciences

Stanford, CA, US

MA PUBLIC POLICY

Mar 2021 - June 2022

- Research: Towards an Equitable Development of the Regional Earthquake Resilience of the Metropolitan Manila, Philippines
- Advisor: Dr. Jack Baker

Stanford University, School of Engineering

Stanford, CA, US

MS CIVIL & ENVIRONMENTAL ENGINEERING

Sep 2019 - June 2022

- Research: Bayesian Updating of Seismic Ground Failure Estimations via Causal Graphical Models with Satellite Imagery
- Advisors: Dr. Hae Young Noh, Dr. Susu Xu, and Dr. David Wald (USGS)

Stanford University, Graduate School of Business

Stanford, CA, US

EXECUTIVE EDUCATION IGNITE CERTIFICATE, ENTREPRENEURSHIP AND INNOVATION

Jan - Mar 2021

- Workshops: Market Segmentation, Design Thinking, Financial Analysis, Business Model, Go-to-Market Strategy, Pitching

University of the Philippines Los Baños

Laguna, Philippines

BS CIVIL ENGINEERING (RANK 1/341, MAGNA CUM LAUDE, COMPLETED ONE SEMESTER EARLY)

Jun 2013 - Jan 2018

- Research: Low-Frequency Impedance Spectroscopy of Cement Paste Matrix Admixed with Nanosilica
- Advisors: Dr. Marish Madlangbayan and Dr. Alvin Karlo Tapia

Tokyo Metropolitan University

Tokyo, Japan

EXCHANGE PROGRAM CERTIFICATE, INTEGRATED RIVER ENGINEERING WORK

Oct - Nov 2017

- Workshops: Advanced Technique on Flood Control, Water Supply, and Aquatic Environment for Megacity

Professional Experience

- Oct 2023 - Present **Doctoral Researcher**, Department of Architecture, Centre for Risk in the Built Environment
Synthesizing various global time-series exposure datasets and local census-based information to assess the dynamics of disaster (e.g., earthquakes, typhoons) risk using machine learning.
- Aug - Sep 2023 **Summer Researcher**, Centre for Remote Sensing of Land Surfaces, University of Bonn, Germany
Integrated the new World Settlement Footprint 3D dataset into a spatial disaggregation exposure model of estimated built-up area map of Santiago, Chile.
- Mar - Aug 2022 **Urban Resilience Research Fellow**, EMI, an International Scientific NGO, Philippines
Developed risk assessment tools using MATLAB to analyze 400,000 buildings and 3.2-million population subjected to the "Big One" Mw-7.2 earthquake of the Marikina West Valley Fault System.
- Dec 2021 - May 2022 **Public Policy Graduate Researcher**, Stanford Public Policy Program, US
Designed city-wide GIS maps and wrote MATLAB modules to calculate economic, space, and social losses of 23 cities with 1.14 million buildings using an OpenQuake-run probabilistic hazard analysis.

Professional Experience (Continued)

- Mar 2021 - Mar 2022 **Earthquake Risk & Loss Consulting Assistant**, Stanford Land, Buildings, and Real Estate, US
Analyzed the financial losses and business interruption of 750 buildings subjected to large earthquakes (up to Mw-7.6) and designed a Tableau dashboard for stakeholders' use.
- Jun - Sep 2021 **Structures & Natural Hazards Research Intern**, FM Global, Engineering & Research Group, US
Improved the firm's library of seismic design hazard and maps by more than 246%, starting with 130 and ending with 320 maps (or 190 new maps) from over 130 countries and territories.
- Jun 2020 - Jun 2021 **Geospatial & Machine Learning – Graduate Research Assistant**, Stanford Noh Research Group, US
Wrote MATLAB modules to apply Bayesian causal inference that uses satellite imagery to improve the landslide, liquefaction, and building damage models for global earthquake loss estimation.
- Jul 2018 - Jul 2019 **Graduate Structural Design Engineer**, Arup, Buildings Department, Philippines
Post-earthquake and safety assessment of a tall building with 50 floors.
Performance-based design peer review of two buildings with 41 and 43 floors and four basements.
Code-based design peer reviews of three tall buildings with 43-49 floors and four basements each.
Liquefaction susceptibility assessment of a three-tower building in a reclamation area.
- May - Jul 2017 **Planning and Control Engineering Intern**, Makati Development Corporation, Philippines
Improved the operations of the Project Planning & Control Office by designing an Excel-VBA program to monitor the deliverables of over 100 national projects with real-time technical report status.

Publications

- Xu, S., **Dimasaka, J.**, Wald, D., & Noh, H.Y. (2022). Seismic multi-hazard and impact estimation via causal inference from satellite imagery. *Nature Communications* **13**, 7793.
- Dimasaka, J.**, Peralta, E.K., Peralta, M.M., Tapia, A.G., & Madlangbayan, M.S. (2017). Effect of nano-SiO₂ from rice hull ash on the conductivity of cement paste. *Emerging Materials Research*, 7(3): 164-168.

Conference Presentations

- Dimasaka, J.**, Selvakumaran, S., and Marinoni, A. (2023). Near-real-time Country-wide Estimation of Susceptibility and Settlement Exposure from Norwegian Mass Movements via Inter-graph Representation Learning, Oral Presentation on Earth Observations for Monitoring and Assessment of Risk and Resilience of Communities and Infrastructure. American Geophysical Union Annual Meeting 2023.
- McDonald, A., **Dimasaka, J.**, Plumridge, M., Torry, J., Zúñiga Gonzales, A.C, van Zeeland, L., Rogers, M., and Hosking, S. (2023). Classifying Sea Ice in High-Resolution SAR Imagery Using Deep Learning. European Geosciences Union General Assembly Conference.
- Wald, D., Xu, S., Noh, H., **Dimasaka, J.**, Jaiswal, K., Allstadt, K., and Engler, D. (2022). Integrated Strategies for Enhanced Rapid Earthquake Shaking, Ground Failure, and Impact Estimation Employing Remotely Sensed and Ground Truth Constraints. 12th National Conference on Earthquake Engineering, Topic Session on Novel Post-Earthquake Assessment Analysis and Modeling Techniques, Salt Lake City, Utah, United States.
- Xu, S., Wald, D., **Dimasaka, J.**, and Noh, H. (2022). Causality-Informed Bayesian Inference for Rapid Seismic Ground Failure and Building Damage Estimation. 12th National Conference on Earthquake Engineering, Topic Session on Novel Post-Earthquake Assessment Analysis and Modeling Techniques, Salt Lake City, Utah, United States.
- Wald, D., Xu, S., Noh, H., **Dimasaka, J.**, Jaiswal, K., and Engler, D. (2022). Enhanced Rapid Earthquake Ground Failure and Impact Estimates with Remotely Sensed and Ground Truth Constraints. Seismological Society of America Annual Meeting, Bellevue, Washington, United States.
- Xu, S., **Dimasaka, J.**, Wald, D., and Noh, H. (2022). Bayesian Updating of Seismic Ground Failure Estimations via Causal Graphical Models with Satellite Imagery. 17th World Conference on Earthquake Engineering, Sendai, Japan.
- Dimasaka, J.**, Xu, S., Wald, D., and Noh, H. (2021). Improving Post-earthquake Disaster Response using Bayesian-Updated Ground Failure Models with Satellite Imagery. 20th Association of Structural Engineers of the Philippines (ASEP) International Convention.

Invited Talks

Summer 2023. *Computing in Civil Engineering*. University of the Philippines Los Baños, Department of Civil Engineering, Laguna, Philippines.

Spring 2023. *Mapping Global Disaster Risk using AI and Earth Observation Data: Examples from Climate-Induced Mass Movement and Seismic Multi-Hazard Impact Assessment*. Moody's Risk Management Solutions - Model Development Team, London, UK.

Awards, Fellowships, & Grants

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| 2022-2026 | UKRI CDT Studentship , Engineering & Physical Sciences Research Council | £ 106,000 |
| | Departmental Award , Department of Earth Sciences, AI4ER, University of Cambridge | £ 106,000 |
| 2019-2022 | Knight-Hennessy Graduate Fellowship , Stanford University | \$ 240,000 |
| 2018 | International Publication Award , Office of the Vice President for Academic Affairs, University of the Philippines | |
| 2018 | BPI-DOST Science Awards , BPI Foundation and the Department of Science and Technology | |
| 2018 | UPLB CEAT Academic Excellence Award , University of the Philippines | |
| 2017 | First Prize, Best Scientific Oral Presentation at ASEAN-CAFMN , Philippine Council for Industry, Energy, and Emerging Technology Research & Development | ₱ 15,000 |
| 2017 | Third Place, Most Outstanding Civil Engineering Students (MOCES) National Award , Philippine Institute of Civil Engineers | |
| 2013-2017 | DOST RA 7687 Undergraduate Scholarship , Science Education Institute | ₱ 347,000 |
| | RSFI Undergraduate Scholarship , Ramar Foods International | ₱ 200,000 |

Outreach & Professional Development

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| Aug 2018 - present | Registered Civil Engineer , Philippine Regulatory Commission Structural Engineering and Construction = 91% Hydraulics and Geotechnical Engineering = 93% Mathematics, Surveying, and Transportation Engineering = 89% |
| Jun 2016 - Jun 2017 | Registrations Head , National Engineering Congress, Philippines Established a detailed strategy of pre-event invitation scheme and registration mechanism that resulted in a fivefold increase in the number of participants (1,500 in the year 2017, 300 in the year 2016) in the Materials and Construction Engineering Seminar and the National Intercollegiate Engineering Science Quiz Contest Year XII. |
| 2014 - 2018 | College Scholarship Interviewer , Ramar Scholarship Foundation Interviewed 40 first-gen low-income graduating high school students living in disadvantaged communities like mountainous or informal settling areas in Paete, Laguna to assist the donors in providing four-year financial packages for any college degree. |

Technical Skills

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| Programming | R, Python, MATLAB, Visual Basic |
| Mapping | QGIS, Story Map, Tableau |
| Building | AutoCAD, REVIT, Dynamo, Design Review, SimaPro, Bluebeam |
| Designing | ETABS, SAFE, Enercalc, Mastan2, Oasys GSA, STAAD, MS Excel, FReW, Pile |