

## ALBEN ROME B. BAGABALDO

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### RESEARCH INTERESTS

Digital Twin Modeling, Intelligent Transportation Systems, Real-Time Traffic Management, Network Science, and Human-Centered Mobility and Safety

### EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY

Berkeley, CA

**Ph.D. in Civil and Environmental Engineering**

August 2024

Labs: [Mobile Sensing Lab](#) & [HumNet Lab](#) | Affiliations: [Berkeley ITS](#) & [BAIR](#)

Dissertation: *Navigating Urban Traffic: From Data to Simulations to Real-World Impacts*

Adviser: Prof. Alexandre M. Bayen

Other dissertation committee members:

Assoc. Prof. Marta C. Gonzalez & Prof. Joan Walker

MAPÚA UNIVERSITY

Manila, Philippines

**Master of Science in Civil Engineering**

August 2016

Major: Transportation Engineering

Thesis topic: *Determination of Barriers towards Addressing Mobility and Accessibility through Traffic Simulation: Case of Intramuros, Manila*

SOUTHERN LUZON STATE UNIVERSITY

Lucban, Philippines

**Bachelor of Science in Civil Engineering** (*cum laude*)

March 2012

### PROFESSIONAL/ACADEMIC EXPERIENCE

PRINCETON UNIVERSITY

Princeton, NJ

#### Postdoctoral Research Associate

- Currently conducting research on Digital Twins for Intelligent Intersections with the [Complex Infrastructure Systems](#) group led by Prof. Jürgen Hackl

This project aims to introduce an innovative approach to transform and modernize these traffic intersections, leveraging the potential of digital twins. These digital entities provide real-time insights, simulate traffic conditions, forecast and mitigate potential accidents, and optimize traffic flows, ensuring safer and more efficient travel for human-centered mobility.

UNIVERSITY OF CALIFORNIA, BERKELEY

Berkeley, CA

**Graduate Student Instructor (GSI)** for the following courses:

- PHYSICS 8A - Introductory Physics: Spring 2024 semester & Summer Term 2023
- CE C263H/CP C257H - Human Mobility and Network Science: Fall 2023 semester
- CE 295 - Data Science for Energy: Spring 2023 & Fall 2021 semesters
- CE 263N - Scalable Spatial Analytics/CP 257 - Data Science for Human Mobility and Socio-technical Systems: Fall 2022 semester
- CE 259 - Public Transportation Systems: Spring 2022 semester
- CE C88/CP C88 - Data Science for Smart Cities: Spring 2021 semester

As a Graduate Student Instructor (GSI) at UC Berkeley, my responsibilities include conducting discussion classes, and facilitating lab sessions as needed, holding regular office hours to provide academic support for students, assessing student work such as homework assignments, exams, and lab reports, and offering guidance to students on their class projects.

**Reader** for IE 242 - Applications in Data Analysis: Fall 2019, Spring 2020, Fall 2020, Spring 2021, Fall 2021 semesters:

As a Reader, I evaluated homework assignments and midterm exams for students in a course focused on fundamental concepts in programming, databases, machine learning, and statistical modeling. This course aimed to address inquiries from both business and social science perspectives.

**Mentorship of UC Berkeley students:**

Served as a research mentor for four (4) undergraduate students. Two of them are employed at a major tech company:

*Undergraduate students:*

Arya Bakhtiar, EECS: 2023 - 2024. Master's student at Stanford

Preston Fu, EECS: 2022-2023

Qianxin Gan, EECS: 2022-2023. Currently a Software Engineer at Google

John Lee, EECS: 2021- 2022. Currently Software Engineer at Wing

*Graduate student:* Yuhan Tang, Systems Engineering (CEE), 2023-2024  
Currently a graduate student at MIT

MAPÚA UNIVERSITY

Manila, Philippines

**Instructor/Lecturer** (Oct 2016 - January 2019):

Faculty Member, School of Civil, Environmental, and Geological Engineering  
Taught undergraduate courses in Methods of Research, Transportation Engineering,  
Engineering Economy, etc.;  
Supervised undergraduate theses

**Program Chair**, Construction Engineering Management (August-December 2018):

Acted as the primary faculty advisor for students pursuing Bachelor's and Master's  
degrees in Construction Engineering and Management; Managed administrative tasks for  
the program, including curriculum design and faculty teaching allocations.

**Research Coordinator** for the School of Civil, Environmental, and Geological Engineering  
(October-December 2016): Headed the planning for research agenda of the school.

Researcher (June 2013 - May 2017):

**Senior Science Research Specialist** (September 2016-May 2017):

Reported directly to the Chief Science Research Specialist and Project Leader regarding  
policies and administration of the Department of Science & Technology (DOST)-funded  
research project, "Mapúa Phil-LiDAR 1" (Flood Hazards Modeling for the Provinces of  
Cavite, Batangas, Rizal, and Quezon). Orchestrated culminating activities for the project,  
including mentoring sessions with local government units and the maps turnover  
ceremony.

**Research Associate** (June 2013-August 2016):

Worked full-time as a Geographic Information System (GIS) specialist, primarily  
responsible for completing terrain models derived from pre-processed Light Detection  
and Ranging (LiDAR) data.

SOUTHERN LUZON STATE UNIVERSITY

Lucban, Philippines

**Contract of Service Instructor** (June 2013 - April 2014)

Undergraduate Instructor at the College of Engineering - Department of Civil Engineering: Taught undergraduate courses in traffic engineering, soil mechanics, and fluid mechanics.

## PUBLICATIONS

### *Journal:*

Alben BAGABALDO, Qianxin GAN, Alexandre BAYEN, Marta GONZALEZ (2024). **Impact of navigation apps on congestion and spread dynamics on a transportation network**: Data Science for Transportation. <https://doi.org/10.1007/s42421-024-00099-w>

Fang-Chieh CHOU, Alben BAGABALDO, Alexandre BAYEN (2022). **The Lord of the Ring Road: A review and evaluation of autonomous control policies for traffic in a ring road**: ACM Transactions on Cyber-Physical Systems, Vol. 6 Issue 1. <https://doi.org/10.1145/3494577>

Alben BAGABALDO, Jeralou ANOSA, Jeremy GAPUSAN, Kevin SORIANO, Francis UY, Riches BACERO (2017). **Determining the Potential Effects of the Proposed Removal of South Provincial Buses along Epifanio de los Santos Avenue (EDSA) using Commuters' Perception**: Journal of the Eastern Asia Society for Transportation Studies, Vol. 12 Pages 489-504. <https://doi.org/10.11175/easts.12.489>

### *Conferences:*

Theophile CABANNES, Alben BAGABALDO, Junghwan LEE, Qianxin GAN, Ayush JAIN, Alice BLONDEL, Alexandre BAYEN (2023). **Creating, Calibrating, and Validating Large-Scale Microscopic Traffic Simulation**: Transportation Research Board 102nd Annual Meeting (TRBAM-23-02502). <https://trid.trb.org/view/2087449>

Alben BAGABALDO, Marta GONZALEZ (2022). **Predicting Traffic Flow on Faulty Traffic Detectors Using Machine Learning Techniques**: Proceedings of the International Conference on Transportation and Development 2022. <https://doi.org/10.1061/9780784484319.019>

Alben BAGABALDO, Francis UY (2016). **Determination of Barriers towards Addressing Mobility and Accessibility through Traffic Simulation: the Case of Intramuros, Manila**: Japan Society of Civil Engineers 18th International Summer Symposium, Page 71-72

## PRESENTATIONS/TALKS

### *Conference Presentations:*

Alben BAGABALDO, Qianxin GAN, Alexandre BAYEN, Marta GONZALEZ (2023). **Price of Information and the Spread of Congestion**: Oral/podium presentation at the ASCE International Conference on Transportation and Development 2023

Alben BAGABALDO, Qianxin GAN, Junghwan LEE, Alexandre BAYEN, Marta GONZALEZ (2023). **Large-scale Simulation-based to Understand Selfishness in Routing**: Poster presentation at the ASCE International Conference on Transportation and Development 2023

### *Panel speaker:*

Alben BAGABALDO (2023). *Research Highlights for PhD Students*. Panel speaker at the ASCE International Conference on Transportation and Development 2023

### *Media Interview:*

CNN Philippines: The Service Road by James Deakin: Modeling Cities through Satellite Images (10-min Studio Interview), Airing date: May 31, 2017

### *Other Talks:*

Guest Lecture in CE 295 - Data Science for Energy (Spring 2024), University of California, Berkeley

Mapua Phil-LiDAR 1 Maps Turnover Ceremony: Big Data, The Bayleaf Hotel, Intramuros, Manila, March 16, 2017

Transportation Summit Mapa Institute of Technology (TransMIT) 2017: Geospatial Information and Civil Systems for a Sustainable and Inclusive Transportation, Mapua Institute of Technology, Manila, March 2, 2017

Intelligent Transportation Systems (ITS) Forum: An event by the De La Salle University-Manila co-presented by the Transportation Science Society of the Philippines), De La Salle University, Manila, February 17, 2017

## AWARDS/FELLOWSHIPS

**2024 Outstanding Graduate Student Instructor (GSI) Award**: An award sponsored by the GSI Teaching and Resource Center, in recognition of exceptional achievements as a teacher. Approximately 10% of the GSIs serving at UC Berkeley campus earned this distinguished award.

**Commission on Higher Education - Philippine California Advanced Research Institutes**

**Ph.D. Overseas Scholarship (January 2019-December 2023):** Recipient of a five-year fully-funded fellowship by the Philippine government to study Ph.D. at UC Berkeley

**Dean's Council Scholarship:** Recipient of the Dean's Council Scholarship as a student of Master of Science in Civil Engineering at Mapua Institute of Technology (now Mapua University)

**2016 Japan Society of Civil Engineers (JSCE) Study Tour Grant:** This is a unique one-week program for young civil engineers to learn Japanese civil engineering technology and projects. Recipients are selected by JSCE among the nominees of each participating country where they are also asked to present their research at the International Summer Symposium.

**2016 Young Future Energy Leaders at Masdar Institute** (now, Khalifa University): An outreach initiative of Masdar Institute of Science and Technology, is a key element of the annual World Future Energy Summit (WFES) that is held in Abu Dhabi. YFEL focuses on raising the awareness of students and young professionals in the fields of renewable energy and sustainability.

**LEADERSHIP AND SERVICE**

*Referee service:*

**Transportation Research Board Annual Meeting (2023 & 2024)**

**IEEE International Conference on Intelligent Transportation Systems (2023 & 2024)**

*Leadership:*

Vice President & Founding Member, **Representation of Asian and Pacific Islanders in the Department of Civil and Environmental Engineering (RAPID-CEE)**, UC Berkeley, 2023-2024

Faculty Adviser, **Transportation Science Society of the Philippines - Mapúa Student Chapter**, Mapúa University, 2016-2018

Vice President, **College of Engineering - Student Council**, Southern Luzon State University, 2010-2011

**PROFESSIONAL ORGANIZATIONS**

Regular Member, **Eastern Asia Society for Transportation Studies**, 2017-present

Associate Member, **Japan Society of Civil Engineers**, 2017-present

Student Member, **American Society of Civil Engineers**, 2021-present

Regular Member, **Transportation Science Society of the Philippines**, 2016-present