Pingfan Hu, Ph.D.

Engineering Management and Systems Engineering
The George Washington University, Washington, D.C., USA

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EDUCATION

The George Washington University Washington, D.C. 2026
Ph.D., Systems Engineering

Dissertation (defended August 2026): *Sustainable Transportation, Sustainable Research: Consumer Adoption and Grid Peak-Shaving of Battery Electric Vehicle Smart Charging, Inspiring the surveydown Open-Source Survey Platform*
Doctoral Committee: *John Paul Helveston (Advisor), Caitlin Grady, Johan René van Dorp, & Eric Hittinger*

University of Sydney Sydney, NSW, Australia 2018
M.P.E., Mechanical Engineering

Pennsylvania State University State College, PA, USA 2015
B.S., Industrial Engineering

RESEARCH INTERESTS

- Discrete choice modeling and consumer preferences
- Incentive and program design in energy and transportation
- Electric vehicle grid integration
- Systems modeling: optimization, agent-based and discrete-event simulation (Simio), system dynamics (Vensim), and network analysis
- Survey methodology and open-source research software
- Agentic AI workflows for research software

RESEARCH EXPERIENCE

The George Washington University Washington, D.C. 2023 - 2026
Graduate Research Assistant, Helveston Lab

- Sloan Foundation-funded study of electric vehicle smart charging, with UC Davis and UC Irvine. Partner utilities: Southern California Edison, Pacific Gas & Electric, and National Grid.
- Designed a national choice experiment with 1,356 EV owners. Managed its recruitment budget across Meta and Dynata, with A/B tests to find the most cost-effective approach.
- Ran the survey under GW IRB approval (NCR245575) with informed consent.
- Estimated mixed logit models of enrollment: owners value flexibility and recurring payments most. Used the models to predict uptake for program designs not yet offered.
- Simulated 10,000 EVs, each with its own travel pattern, against CAISO and NYISO load in 55 time-of-use and enrollment scenarios. Managed charging cut CAISO peaks by up to 5.6 GW. Moderate enrollment, not maximum, was the most cost-effective.
- Presented findings to stakeholders at the partner utilities and the Sloan Foundation.
- Lead developer of surveydown and sdstudio.

The George Washington University Washington, D.C. May - Aug. 2023

Student Research Specialist, Professor Caitlin Grady's FEWS Lab

- Built a multi-layer network model of the Mid-Atlantic freight system (road, rail, air, and marine) in Python.
- Ranked its nodes by betweenness, closeness, and degree centrality. Measured its resilience under targeted and random node removal.

PUBLICATIONS

ORCID: 0009-0001-4877-4844 | Google Scholar Profile

A. Journal Articles

1. **Hu, P.**, Tarroja, B., Dean, M., Forrest, K., Hittinger, E., Jenn, A., & Helveston, J. P. (2025). "Measuring electric vehicle owners' willingness to participate in smart charging programs." *Environmental Research Letters*, 20(12), 124067. DOI: 10.1088/1748-9326/ae2597
2. **Hu, P.**, Bunea, B., & Helveston, J. P. (2025). "surveydown: An open-source, markdown-based platform for programmable and reproducible surveys." *PLOS ONE*, 20(8), e0331002. DOI: 10.1371/journal.pone.0331002

B. Conference Papers

1. **Hu, P.**, Tarroja, B., Dean, M., Forrest, K., Hittinger, E., Jenn, A., & Helveston, J. P. (2025). "Measuring consumer willingness to enroll in battery electric vehicle smart charging programs." Presented at the Transportation Research Board 104th Annual Meeting, Washington, D.C. Paper No. TRBAM-25-01317.
2. **Hu, P.**, Tarroja, B., Dean, M., Forrest, K., Hittinger, E., Jenn, A., & Helveston, J. P. (2024). "Measuring consumer willingness to enroll in battery electric vehicle smart charging programs." *2024 IEEE Vehicle Power and Propulsion Conference (VPPC)*, 1–17. DOI: 10.1109/VPPC63154.2024.10755299

C. In Revision & Working Papers

1. **Hu, P.**, Tarroja, B., Dean, M., Forrest, K., Hittinger, E., Jenn, A., & Helveston, J. P. (2025). "Quantifying the peak-shaving potential and cost efficiency of battery electric vehicle supplier-managed charging." In revision at *Environmental Research: Infrastructure and Sustainability*. Replication data and code to be released on publication.
2. **Hu, P.**, Bunea, B., & Helveston, J. P. (2025). "sdstudio: A companion package for designing and managing surveydown surveys." Working paper.

RESEARCH FUNDING

- *Alfred P. Sloan Foundation*, Grant G-2023-20976 (Sept. 2023 - Dec. 2026). Electric vehicle smart charging research at George Washington University with UC Davis and UC Irvine. PI: John Paul Helveston. Role: Graduate Research Assistant, funded by the grant.

SOFTWARE & DATA

1. Helveston, J. P., **Hu, P.**, & Bunea, B. (2024). "surveydown: Markdown-Based Surveys Using Quarto Shiny Documents." R package; 180+ GitHub stars, 11,000+ CRAN downloads. surveydown.org.

2. **Hu, P.**, Helveston, J. P., & Bunea, B. (2025). "sdstudio: Companion Application for the surveydown Survey Platform." R package; 2,500+ CRAN downloads. CRAN.R-project.org/package=sdstudio.
3. **Hu, P.**, & Helveston, J. P. (2026). "Emaki: An Agentic Development Environment that keeps, searches, and continues Claude Code and Codex sessions." Desktop application for macOS, Windows, and Linux, built in Rust with GPUI. Alkaline Software. emaki.lol.
4. **Hu, P.** (2025). "TidyViz: A Python package for tidying and visualizing survey data." Python package.
5. **Hu, P.**, Tarroja, B., Dean, M., Forrest, K., Hittinger, E., Jenn, A., & Helveston, J. P. (2025). "smart-charging-preferences-2025: Replication data and code for the EV smart charging preferences study." Survey data and R code, with a Shiny enrollment simulator. Zenodo. DOI: 10.5281/zenodo.17911540

PRESENTATIONS

A. Conferences

1. "Quantifying the Peak-Shaving Potential and Cost Efficiency of Battery Electric Vehicle Supplier-Managed Charging," with Brian Tarroja, Matthew Dean, Kate Forrest, Eric Hittinger, Alan Jenn, and John Paul Helveston. ASTR Conference 2026, University of California, Davis. Davis, CA. Oct 27, 2026.
2. "sdstudio: A Companion Package for Designing and Managing surveydown Surveys." GW Open Source Conference 2026. Washington, D.C. Mar 23, 2026.
3. "surveydown: An Open-Source, Markdown-Based Platform for Reproducible and Programmable Surveys." Quant UX Con 2025. Virtual. Nov 5, 2025.
4. "surveydown: An open-source platform for programmable, markdown-based surveys." U.S. Research Software Engineer Conference 2025. Philadelphia, PA. Oct 6, 2025.
5. "surveydown: A Markdown-Based Platform for Interactive and Reproducible Surveys Using Quarto and Shiny," with John Paul Helveston. Posit Conference 2025 - The R & Python Data Science Conference. Atlanta, GA. Sep 17, 2025.
6. "Grid-Integration of Electric Vehicles: Consumer Preferences for Supplier Managed Charging." Bridging Transportation Researchers 7. Virtual. Aug 6, 2025.
7. "surveydown: An Open-Source, Markdown-Based Platform for Interactive and Reproducible Surveys." GW Open Source Conference 2025. Washington, D.C. Mar 24, 2025.
8. "Measuring Consumer Willingness to Enroll in Battery Electric Vehicle Smart Charging Programs," with Brian Tarroja, Matthew Dean, Kate Forrest, Eric Hittinger, Alan Jenn, and John Paul Helveston. 2024 IEEE Vehicle Power and Propulsion Conference (VPPC). Washington, D.C. Oct 3, 2024.

B. Posters

1. "Peak-Shaving Potential and Cost Efficiency." GW 2026 R&D and Senior Design Showcase, The George Washington University. Washington, D.C. Apr 24, 2026.
2. "surveydown: An Open-Source, Markdown-Based Survey Platform." GW 2025 R&D and Senior Design Showcase, The George Washington University. Washington, D.C. Apr 25, 2025.
3. "Electric Vehicle Owner Preferences for Smart Charging." GW 2025 R&D and Senior Design Showcase, The George Washington University. Washington, D.C. Apr 25, 2025.

4. "The BEV Smart Charging Adoption Project." 2025 Transportation Research Board 104th Annual Meeting. Washington, D.C. Jan 6, 2025.

TEACHING

A. Teaching Assistantships

- Fall 2025 - EMSE 4572/6572: Exploratory Data Analysis (undergraduate & graduate).
- Spring 2025 - EMSE 4571: Programming for Analytics (undergraduate).
- Presented lectures to the class of 40 students and mentored every team through its project.
- Proctored the class's regular and make-up exams, and graded all homework and exams.
- Held one-on-one sessions with students in class, in office hours and on Zoom.

B. Workshops

- "Agentic Workflows with Claude Code," with John Paul Helveston. GW Trustworthy AI Initiative Summer Workshop 2026. Washington, D.C. Aug 14, 2026. pingfan-hu.github.io/2026-agentic-workshop.
- "surveydown: An Open-Source, Markdown-Based Platform for Reproducible and Programmable Surveys," with John Paul Helveston. Quant UX Con 2025 Workshop Session. Virtual. Nov 6, 2025. jhelvy.github.io/2025-qux-surveydown-workshop.
- "surveydown: An Open-Source, Markdown-Based Platform for Programmable and Reproducible Surveys," with John Paul Helveston. Workshops for Ukraine. Virtual. May 29, 2025. jhelvy.github.io/2025-surveydown-workshop.

HONORS & RECOGNITION

- 2025: Profiled by GW Engineering for contributing to the surveydown platform.
- 2024: 2nd Prize in GW's 2024 Student Open Source Awards for the surveydown R package.

SERVICE & MEMBERSHIPS

A. Peer Review

- *Applied Energy* (Elsevier): 2 reviews, 2025.
- *Engineering Research Express* (IOP Publishing): 5 reviews, 2025 - 2026.

B. Professional Qualifications & Memberships

- Engineers Australia assessment (2022): both degrees in engineering meet the Professional Engineer standard (Mechanical Engineer, ANZSCO 233512; Industrial Engineer, ANZSCO 233511).
- Institute of Electrical and Electronics Engineers (IEEE)
- Transportation Research Board (TRB)

INDUSTRY EXPERIENCE

Alkaline Software Remote 2026 - Present

Co-Founder & Principal Engineer

- Co-founded a desktop app studio with Professor John Paul Helveston.

- Lead developer of Emaki, an Agentic Development Environment (27 releases). Also lead developer of the Mac apps Onyx (notes), Kotoba (dictation), and tabflip (window switching).
- Built the studio's design system and its Rust and GPUI app template for macOS, Windows, and Linux.

Harsco Rail SC, USA & Beijing, China 2021 - 2022

Software Engineer

- Led C++ and CAN bus software for the Undercutter and Grinder rail maintenance machines across teams in the USA and China; delivered 25 releases.
- Liaison between customers, US management, and the China team; ran on-site testing.

Daimler Greater China Beijing, China 2020 - 2021

Engineering Consultant (Contract, through EnSure Auto)

- Managed engineering changes for three Mercedes-Benz SUVs localized for China, one of them electric.
- Decided on R&D change requests. Analyzed plant workforce, layout, and production schedules.

GE Appliances Qingdao, China 2019 - 2020

Project Engineer, Edison Engineering Development Program

- Managed 500+ components across 9 washing machine models, from development to production. Tracked them in product lifecycle management.

Kurtz Ersa GmbH Wertheim, Germany Jan. - Mar. 2017

Assistant Process Engineer (Intern)

- Ran a 2-month Design of Experiments on a new soldering method over 200 PCB samples.

SKILLS

Research Methods: Discrete Choice, Logit Modeling, Statistical Modeling, Econometrics, Survey Design, A/B Testing, Simulation, Optimization

Data Science: tidyverse, ggplot, PostgreSQL

Programming: R, Python, Rust, Swift, SQL, JavaScript, Shell, Git

Generative AI: Claude Code, Codex, LLM Workflows, Skills, MCP, Hooks

Web Development: Quarto, Shiny, HTML, CSS, Docker, Google Cloud

App Development: GPUI, SwiftUI, UI/UX Design

LANGUAGES

- Mandarin Chinese - Native
- English - Full professional proficiency

REFERENCES

- **John Paul Helveston**, Associate Professor, Engineering Management and Systems Engineering, The George Washington University (Ph.D. Advisor). jph@gwu.edu
- **Eric Hittinger**, Associate Professor, Department of Public Policy, Rochester Institute of Technology (Ph.D. Committee Member). eshgpt@rit.edu

– **Alan Jenn**, Associate Professor, Civil and Environmental Engineering, University of California, Davis (Co-author). ajenn@ucdavis.edu