

# Wenyu Chiou

## Artificial Intelligence Evaluation & Behavioral Simulation Research Engineer

Bethlehem, PA · +1 (484) 937-2528 · [wec324@lehigh.edu](mailto:wec324@lehigh.edu) · [linkedin.com/in/wenyu-chiou](https://www.linkedin.com/in/wenyu-chiou) · [github.com/WenyuChiou](https://github.com/WenyuChiou) · [wenyuchiou.github.io](https://wenyuchiou.github.io)

Research engineer building and evaluating LLM agents through behavioral experiments, agent-based simulation, and quantitative model validation. Develops tool-using workflows, evaluation infrastructure, and constraint-checked governance systems spanning human behavior, physical systems, and financial outcomes.

Open to Summer 2027 internships in LLM evaluation, agent systems, behavioral simulation, and AI for science.

F-1 student · CPT eligible for internships

### — EXPERIENCE

**Graduate Research Assistant** — Complex Adaptive Water Systems Lab, Lehigh University Aug 2024 – present

- Designed a human-versus-LLM study using **937 household responses**, label-blind socioeconomic personas, confirmatory factor analysis, and multi-group structural equation modeling to compare generated behavior with measured pathways; manuscript in preparation.
- Designed and fielded a **937-household** flood-adaptation survey; translated observed pathways into agent parameters through structural equation modeling and Bayesian calibration.
- Built **FLOODABM**, a **52,141-household** agent-based × catastrophe flood simulation across 27 census tracts (2011–2023), with **50 stochastic runs per scenario** and NFIP premium, payout, deductible, and household financial mechanics.
- Designed the **Water Agent Governance Framework (WAGF)** to parse, check, repair, and audit LLM-agent decisions against physical, financial, and behavioral-theory constraints before state updates; in preparation for release.

**Independent Research Engineering & Open Source** 2024 – present

- Built and maintain **ai-research-skills**, a composable workflow from research-gap discovery through study design and drafting, and **agent-collab-skills** for task splitting, reconciliation, debate, and acceptance gates.
- Shipped **research-hub**, a local-first Zotero, Obsidian, and NotebookLM workspace exposed through a CLI, REST API, and Model Context Protocol server with provenance checks and cross-platform tests.
- Created **awesome-agentic-ai-zh**, a maintained trilingual agentic-AI roadmap with **6K+ GitHub stars**; automated checks keep English, Traditional Chinese, and Simplified Chinese resources aligned.

### — SELECTED RESEARCH OUTPUTS

Yang, Y. C. E., & **Chiou, W.** (2026). Leveraging Large Language Models for Agent-Based Simulation of Human–Water System Interactions. *Water Resources Research*, 62(6), e2025WR042111. doi.org/10.1029/2025WR042111 *Published*

**Chiou, W. Y.**, Yang, Y. C. E., Tanaka, T., Jamrussri, S., & Feng, S. Household Flood Adaptation and Financial Outcomes: A Coupled Human–Flood Modeling Analysis of Homeowners and Renters. *Water Resources Research*. *Under revision following peer review*

### — SELECTED CONFERENCE PRESENTATIONS

**ISDSA 2026, Beijing** — “What Makes AI Believable? Comparing AI and Human Responses in Mental Health Risk Assessment.” Paper presentation, July 28–31, 2026.

**AGU25, New Orleans** — “Modeling Long-Term Flood Adaptation Action Across Marginalized and Non-Marginalized Groups: A Coupled Agent-Based Model.” Poster NH41E-0449, abstract 1890827.

**ISHC 2025, Tokyo** — “Investigating the Decision-Making Process and Causal Relationships between Flood Risk Perception and Adaptation Actions.” Oral presentation 38-03.

### — EDUCATION

**Ph.D., Civil & Environmental Engineering**, Lehigh University 2024 – expected Dec 2027

**M.S., Hydrological and Oceanic Sciences**, National Central University 2021 – 2023

**B.S., Earth Sciences**, National Central University 2017 – 2021

### — METHODS & TECHNICAL SKILLS

**LLM / agent systems:** model-behavior evaluation · agent development · structured outputs · validators · targeted repair · audit traces · RAG · tool use · multi-agent workflows · MCP

**Methods:** computational social science · experimental design · psychometrics · CFA / SEM · Bayesian calibration · agent-based modeling · catastrophe modeling

**Tools:** Python · R · MATLAB · C++ · Git · pytest / CI · OpenAI / Anthropic APIs · Ollama · Windows / POSIX