Daniel Weitekamp

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Education

Carnegie Mellon University, Ph.D. in Human-Computer Interaction, 2024
Advisor: Ken Koedinger
Committee: Kurt VanLehn, Vincent Aleven, Brad Myers, Erik Harpstead
University of California, Berkeley, B.A. in Computer Science, 2018

Employment

Georgia Institute of Technology, Atlanta GA
Postdoctoral Fellow, School of Interactive Computing, 2024-Present
Advisor: Christopher MacLellan

Honors and Awards

GRFP - Honorable Mention, 2018
Google Research Award in Support of Smartsheet Project (PI Ken Koedinger), 2020
CERN OpenLab Fellow, 2017
Summer Undergraduate Research Fellowship, Caltech, 2016

Grants and Contracts Writing

National Science Foundation (NSF) CISE (Under Review, Notified Soon): Automating Cognitive Task Analysis with Teachable AI: Scalable, Robust, and Pedagogically-Grounded Instruction for Enhanced Learning, $600,000 over 3 years (Co-PI, Technical proposal lead, PI Christopher MacLellan)

Toyota Research Initiative: Human-AI Kaizen Initiative (Under Review, Notified Nov 2025): Teachable AI Agents to Support Workplace Knowledge Transfer and Process Automation, $1,050,000 over 3 years (Co-PI, PI Christopher MacLellan)

Software Development

Lead Developer/Researcher for AI2T / Apprentice Learner (AL) (2018-on going)

- A computational model of learning (simulates inductive knowledge formation by learning directly from tutorings systems or via interactive training from a human)
  - ➢ SmartSheet: AI supported authoring handwriting enabled tutoring systems
  - ➢ Computational modeling of student learning.

Sole Developer, Cognitive Rule Engine (2021-Present)
[https://github.com/DannyWeitekamp/Cognitive-Rule-Engine]

- High-performance rule engine integrated with Python (compiled with numba). Efficient polynomial time (faster than RETE) pattern matching. (used in AI2T/AL system)

Sole Developer, Spelltacular ITS for Kindergarten Invented Spelling Practice (2021)

- ReactNative application for giving kindergarteners feedback on their invented spellings.

Service

University Service

Organizer for EdBag PIER Seminar series at Carngie Mellon University, 2022

Conference & Workshop Leadership

Track Lead 2023,2025 (co-lead 2020-22) for Computational Models of Learning Track @ LearnLab Summer School

- CML track participants build novel tutoring systems, train simulated students on them and then use educational data-mining techniques to analyze the data.

Program Committees

Reviewer, Educational Data Mining (EDM), 2019,2020, 2024, 2025

Reviewer, Artificial Intelligence in Education (AIED) 2023, 2024, 2025

Reviewer, CHI Conference on Human Factors in Computing Systems, 2023, 2025, 2026

Reviewer, CHI Play, 2021

Reviewer, AIED Workshop (2023): Empowering Education with LLMs - the Next-Gen Interface and Content Generation

Reviewer, Advances in Cognitive Systems, 2025

Teaching Experience

Carnegie Mellon University

Teaching Assistant, Software Structures for User Interfaces (SSUI), Fall 2020

Teaching Assistant, E-Learning Design Principles and Methods, Fall 2021

Publications

1. **Weitekamp, D.**, & Koedinger, K. [Manuscript under review] Computational models of learning: deepening care and carefulness in AI in education with Theory-Driven Simulation. International journal of artificial intelligence in education
2. **Weitekamp, D.**, [In Press 2025] CORGI: Efficient Pattern Matching With Quadratic Guarantees. Advances in Cognitive Systems.
3. **Weitekamp, D.**, N. Siddiqui, M., & J. MacLellan, C. (2025). TutorGym: A Testbed for Evaluating AI Agents as Tutors and Students. International Conference on Artificial Intelligence in Education, 361–376. Springer Nature Switzerland Cham.

4. Gupta, A., Reddig, J., Calo, T., **Weitekamp, D.**, & MacLellan, C. J. (2025). Beyond final answers: Evaluating large language models for math tutoring. International Conference on Artificial Intelligence in Education, 323–337. Springer Nature Switzerland Cham.
5. **Weitekamp, D.**, MacLellan, C., Harpstead, E., & Koedinger, K. (2025). Decomposed inductive procedure learning: Learning academic tasks with human-like data efficiency. Proceedings of the Annual Meeting of the Cognitive Science Society, 47.
6. **Weitekamp, D.**, Harpstead, E., & Koedinger, K. (2024). AI2T: Building trustable AI tutors by interactively teaching a self-aware learning agent. arXiv Preprint arXiv:2411. 17924.
7. **Weitekamp, D., (2024).** Building Educational Technology Quickly and Robustly with an Interactively Teachable AI. Doctoral dissertation, Human-Computer Interaction Institute, Carnegie Mellon University, Pittsburg, PA.
8. Rachatasumrit, N., **Weitekamp, D. [equal contrib.]**, & Koedinger, K. R. (2024). Good Fit Bad Policy: Why Fit Statistics Are a Biased Measure of Knowledge Tracer Quality. International Conference on Artificial Intelligence in Education, 183–191. Springer Nature Switzerland Cham. **[Best Paper Nominee 🥈]**
9. **Weitekamp, D.**, & Koedinger, K. (2024). STAND: Data-Efficient and Self-Aware Precondition Induction for Interactive Task Learning. arXiv Preprint arXiv:2409. 07653.
10. **Weitekamp, D.**, & Koedinger, K. (2023). Computational models of learning: deepening care and carefulness in AI in education. International Conference on Artificial Intelligence in Education, 13–25. Springer Nature Switzerland Cham.
11. **Weitekamp, D.**, Rachatasumrit, N., Wei, R., Harpstead, E., & Koedinger, K. (2023). Simulating learning from language and examples. International Conference on Artificial Intelligence in Education, 580–586. Springer Nature Switzerland Cham.
12. **Weitekamp, D.**, & Stevens, P. (2022). A Mobile Invented Spelling Tutoring System. International Conference on Artificial Intelligence in Education, 492–496. Springer International Publishing Cham.
13. **Weitekamp, D.**, Harpstead, E., & Koedinger, K. (2021). Toward stable asymptotic learning with simulated learners. International Conference on Artificial Intelligence in Education, 390–394. Springer International Publishing Cham.
14. **Weitekamp, D.**, Harpstead, E., & Koedinger, K. R. (2020). An interaction design for machine teaching to develop AI tutors. Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, 1–11.
15. **Weitekamp, D.**, Ye, Z., Rachatasumrit, N., Harpstead, E., & Koedinger, K. (2020). Investigating differential error types between human and simulated learners. International Conference on Artificial Intelligence in Education, 586–597. Springer International Publishing Cham.
16. **Weitekamp, D., III**, Harpstead, E., MacLellan, C. J., Rachatasumrit, N., & Koedinger, K. R. (2018). Toward Near Zero-Parameter Prediction Using a Computational Model of Student Learning. International Conference on Educational Data Mining (EDM) 2018.
17. Harpstead, E., MacLellan, C. J., **Weitekamp, D.**, & Koedinger, K. R. (n.d.). The use of simulated learners in adaptive education. AIAED-19: AI+ Adaptive Education, 1–3.

Notable Extensions of My Simulated Learners

1. Rachatasumrit, N., Carvalho, P. F., Li, S., & Koedinger, K. R. (2023, June). Content matters: A computational investigation into the effectiveness of retrieval practice and worked examples. In *International conference on artificial intelligence in education* (pp. 54-65). Cham: Springer Nature Switzerland. **[Best Paper 🏆]**