JACOB PILAND

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SUMMARY

Ph.D. candidate in Computer Science (Notre Dame) specializing in Trustworthy AI, model evaluation, and machine learning research. Experience spanning LLM evaluation/benchmarking, PyTorch-based model development, statistical analysis for open-ended studies, and applied software engineering (Python/R/MATLAB/C++). Interests include computer vision, anomaly detection, calibration, and robust evaluation

CORE SKILLS

LLM & AI Evaluation: expert question design, benchmark creation, rubric design, failure-mode analysis, instruction-following evaluation, ambiguity/difficulty calibration, qualitative-to-quantitative evaluation

Machine Learning / Research: trustworthy AI, model calibration, energy-based modeling, loss function design, saliency methods, entropy-based methods, experimental design

Programming: Python, PyTorch, PyTorch Lightning, R, MATLAB, C++

Data & Analysis: statistical analysis, open-ended/no-ground-truth evaluation, clustering/cluster analysis

Teaching / Mentorship: technical instruction, curriculum development, intern mentoring, code review/support

Languages: Japanese

EDUCATION

University of Notre Dame du Lac (Notre Dame), South Bend, IN
Ph.D., Computer Science - *Estimated Mar 2026*
M.S., Computer Science - *May 2022*
Utah State University (USU), Logan, UT
B.S., Computer Science - *May 2018*
B.S., Biochemistry - *May 2018*

PROFESSIONAL EXPERIENCE (RESEARCH + INDUSTRY | PAID)

Handshake AI, Handshake AI Fellow (Contract), Remote — *Sep 2025–Present*

- Designed domain-specific expert evaluation questions to benchmark model capability and expose consistent LLM failure modes
- Iterated on question difficulty/ambiguity to isolate errors in reasoning, instruction-following, and domain understanding
- Documented error patterns and recommendations to improve evaluation coverage, reliability, and reviewer consistency

ND Computer Science & Engineering (SCALE Lab), Research Student, South Bend, IN — *Sep 2021–Present*

- Discovered multi-component loss function techniques to combine properties from different ML models using PyTorch / PyTorch Lightning
- Developed methods to reduce dependence on computationally expensive data generation in energy-based models while maintaining trustworthy calibration
- Applied entropy-based concepts to model saliency, improving model performance via entropy manipulation informed by molecular dynamics concepts

ND Computer Science & Engineering, Research Assistant, South Bend, IN — *Aug 2018–Sep 2021*

- Developed statistical analysis for open-ended (no ground truth) studies on protein folding using Python and R

NASA Earth Science, Programming Consultant, Irvine, CA — *May 2018–Aug 2018*

- Guided software development for 28 intern projects using Python, R, and MATLAB
- Built and taught weekly programming lessons in a interactive course for NASA science interns

USU Instructional Technology, Research Assistant, Logan, UT — *Sep 2014–May 2018*

- Contributed to analysis and writing for a cluster analysis study on cognitive effects of computer-based scaffolding across countries and U.S. states (NSF REESE; PI: Brian Belland)

Hewlett Packard Enterprise, Software Engineering Intern, Boise, ID — *May 2017–Aug 2017*

- Increased power-fail code coverage by **500%** in **C++**
- Optimized driver software for **30% faster** performance and 30% less code through refactoring in **C++**

NASA Earth Science, Research Intern, Irvine, CA — *Jun 2015–Aug 2015*

- Modeled ozone production in the L.A. Basin and identified top chemical factors using MATLAB and Python

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Honors: USU CS Outstanding Senior; Undergraduate Researcher of the Year