Samantha Pease, Ph.D. (She/Her)

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EDUCATION

Ph.D., Mathematics, *Rutgers University–Newark* *2026*

Dissertation: *The Local Gan–Gross–Prasad Conjecture for General Spin Groups*
Advisor: Chen Wan

B.S., Mathematics & Computer Science, with Distinction, *Duke University* *2020*

Senior thesis: *Computing Values of Symmetric Square L-Functions using Ichino's Pullback Formula*
Advisor: Aaron Pollack

RESEARCH

LLM Unlearning: Free Recovery as a Diagnostic *2026*

- Independent research (BlueDot Impact sprint): probed 8 published TOFU unlearning checkpoints (Llama-3.2-1B) via LoRA reteaching, testing suppression (NPO) against representation-steering (RMU).
- Recovery was partial: reteaching 10% of the removed content raised answer probability on the untaught remainder (NPO 0.208→0.454), but not word-for-word recall.
- RMU's membership-inference protection, the strongest of any method tested, collapsed by 142 points after the same reteaching: an adversary holding part of the removed data could then identify the rest as training data.

Doctoral Research: Langlands Program *2020–2026*

- Proved the local Gan–Gross–Prasad conjecture for general spin groups via a local trace formula, in both the p-adic and Archimedean settings, extending results of Waldspurger (special orthogonal groups) and Beuzart-Plessis (unitary groups).

FELLOWSHIPS & PROGRAMS

Singapore AI Safety Fellowship, *Singapore AI Safety Hub (SASH)* *2026*

Iliad Intensive *2026*

Technical AI Safety Course & Project Sprint, *BlueDot Impact* *2026*

Masterclass: Relative Trace Formulae, *University of Copenhagen* *2022*

PRUV Research Fellowship, *Duke University* *2019*

INDUSTRY EXPERIENCE

Machine Learning Engineer Intern *2024*
Covar LLC · Durham, NC

- Scoped a 3D scene-segmentation proof of concept with the CTO: an external client needed 3D scenes queryable by object, but SAM and Gaussian Splatting are not natively compatible.
- Surveyed 20+ papers and 5+ open-source integrations, then built the most promising route end to end (video → frame extraction → COLMAP poses → Gaussian Splatting → SAM), validated on 10+ scenes.
- Presented technical tradeoffs and implementation recommendations to the internal team and the client.

SELECTED PROJECTS

BARSElo: Bayesian Skill Estimation from Confounded Team Outcomes *2025–2026*

- Built a Bayesian Bradley–Terry model over a live league (970+ games, 500+ players); designed holdout evaluations the optimizer cannot game after a high-scoring fit turned out to rank players by league, not skill.

Trans Advice Agent *2025*

- Built and deployed a retrieval-augmented QA system that synthesizes community knowledge from forums, for a domain where general-purpose assistants hedge: query expansion with Claude Haiku, FAISS embedding retrieval with MMR for source diversity, and hierarchical summarization that keeps conflicting viewpoints.

TEACHING

Rutgers University–Newark *2020–2026*

Sole instructor: Calculus I (S22); Applied Calculus (Su21, Su23)
TA, large lecture: Precalculus (F21, F24–S25); College Algebra (S23–S24); Applied Calculus (F22)
Tutor, Tutoring Center: AY20–21, AY25–26

Duke University *2017–2020*

Tutor, Math Help Room: Linear Algebra (applied and proof-based) and Multivariable Calculus
Co-instructor, PWild house course: semester-long leadership and outdoor-skills training for new trip leaders

TECHNICAL SKILLS

Python, PyTorch, LoRA/PEFT (HuggingFace, TRL), Claude API, FAISS, NumPy/SciPy, Bayesian modeling, Git