Samantha Pease (She/Her)

(330) 940-9424 | Sam@Walking-Stick.com | SamPease.github.io | github.com/SamPease | linkedin.com/in/sam-pease

SUMMARY

PhD-trained ML engineer transitioning from academia to industry, combining complex problem solving, rigorous assumption awareness, and clear communication with hands-on delivery. Delivered CV/3D prototypes at Covar (Segment Anything (SAM) + Gaussian Splatting; COLMAP SfM; stakeholder demos) and a scale-aware retrieval system (RAG/FAISS IVFPQ with FastAPI & LangSmith) serving the trans community. Strengths across graph & classical ML and clean API design; focused on shipping reliable, user-centered ML for real-world problems.

SKILLS

LLM / Retrieval / Infra: RAG, information retrieval, FAISS (IVFPQ), MMR, hierarchical summarization, prompting, latency/cost, LangChain/LangSmith, FastAPI (async), caching, SQL/SQLite, Git

ML / Models / Tools: Python, PyTorch, PyTorch Geometric, scikit-learn, GNNs, NetworkX, CV (SAM, Gaussian Splatting, COLMAP), HuggingFace, Playwright

EXPERIENCE

Machine Learning Engineer Intern Summer 2024

Covar *Durham, NC*

- Built a video→3D Gaussian Splatting pipeline across 10+ scenes (2K–10K frames/scene) with COLMAP SfM (100+ camera poses/scene) + SAM segmentation for segmented differentiable rendering.
- Integrated & debugged 5+ open-source CV/3D repos (SAM, Gaussian Splatting, COLMAP); processed & cleaned large video datasets; developed pipelines for rapid comparative experiments.
- Synthesized insights from 20+ papers into architecture tradeoffs; presented to internal teams & an external client informing roadmap; produced clear specs under ambiguity; documented assumptions & limitations.

Math Instructor 2017–Present

Duke University & Rutgers University–Newark *Durham, NC & Newark, NJ*

- Taught Applied Calculus & Calculus I; supported large (100+ student) Precalculus, College Algebra, Applied Calculus lectures; created syllabi, assessments, structured problem sessions.
- Translated abstract math for 1000+ students into clear, stepwise explanations; praised for effective teaching.

PROJECTS

Trans Advice Agent Summer 2025

- Built large-scale retrieval over 20K webpages (300K+ chunks) using FAISS IVFPQ (1.8GB→28MB) + MMR with all-MiniLM-L6-v2; query enhancement via Claude; hierarchical summarization (25K→3K tokens).
- Deployed FastAPI (POST /ask) with LangSmith token/latency/error tracing; Render backend + GitHub Pages UI; provenance UI with paginated sources.

Instagram Network Analysis Summer 2025

- Scraped mutuals to build a directed graph (700 nodes/23K edges); trained a 2-layer GCN (PyG) with RandomLinkSplit + negative sampling for link prediction (AUC 0.9352, AP 0.9349); visualized communities (Louvain).

Additional Projects

- From-scratch NumPy image classifier neural net; analyzed architectural tradeoffs (ML course project)
- Topological data analysis + SVM on LiDAR canopy data to differentiate forests (TDA research project)

EDUCATION

Rutgers University–Newark - *Ph.D. Mathematics* May 2026

- Research in Langlands Program (advisor: Chen Wan); Selected coursework: Statistics + ML

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

- PRUV Research Fellow (advisor: Aaron Pollack)