# SAMANTHA PEASE (SHE/HER)

(330) 940-9424  $\diamond$  Sam@Walking-Stick.com  $\diamond$  Brooklyn, NY SamPease.github.io & github.com/SamPease & linkedin.com/in/sam-pease

#### **RESEARCH INTERESTS**

My research lies in the local Langlands program, with a focus on the local Gan–Gross–Prasad conjecture for general spin groups. I study tempered representations of Gan–Gross–Prasad triples through local trace formula techniques, extending prior results for orthogonal and unitary groups. My work addresses both p-adic and Archimedean cases, establishing a multiplicity-one theorem and contributing to the understanding of the local Langlands correspondence for pure inner forms.

# **EDUCATION**

**Rutgers University–Newark** Oct 2025 Ph.D. in Mathematics Advisor: Dr. Chen Wan Thesis: The Local Gan-Gross-Prasad Conjecture for General Spin Groups Overall GPA: 4.0 **Duke University** May 2020 B.S. in Mathematics & Computer Science, with Distinction Advisor: Dr. Aaron Pollack Thesis: Computing Values of Symmetric Square L-Functions using Ichino's Pullback Formula **PRUV** Research Fellow Dean's List Fall 2016, Spring 2017, Spring 2018 Overall GPA: 3.706

### ENGINEERING EXPERIENCE

Machine Learning Engineer Intern	Summer 2024
Covar	Durham, NC

- · Conducted R&D with state-of-the-art ML models, integrating Segment Anything (SAM) and Gaussian Splatting for segmented differentiable 3D rendering across 10+ video scenes (2K-10K frames each)
- Processed video datasets and built structure-from-motion pipelines generating 100+ camera positions; cleaned and prepared data for Gaussian Splatting rendering
- $\cdot$  Synthesized insights from 20+ research papers; implemented code from 5+ models across CV and 3D rendering
- · Presented results to internal teams and an external client, highlighting research-driven development and implementation

#### Wind Turbine Engineering Intern

WindAid, Trujillo, Peru

- Designed and prototyped an IoT-based monitoring system using a Particle Electron to transmit wind turbine performance data (voltage, current, windspeed) from a remote installation
- · Delivered a functional prototype to WindAid's engineering team; reduced reliance on on-site diagnostics for turbines maintained by nontechnical rural users

Summer 2017

# **Rutgers University–Newark**

Newark, NJ

- · AY 2024–2025: TA for large lecture of PreCalculus (MATH 114)
- · AY 2023–2024: TA for large lecture of College Algebra (MATH 109)
- Summer 2023: Instructor for Applied Calculus (MATH 119)
- · Spring 2023: TA for large lecture of College Algebra (MATH 109)
- Fall 2022: TA for large lecture of Applied Calculus (MATH 119)
- · Spring 2022: Instructor for Calculus I (MATH 135)
- Fall 2021: TA for large lecture of PreCalculus (MATH 114)
- Summer 2021: Instructor for Applied Calculus (MATH 119)
- · Fall 2020 & Spring 2021: Tutor in Rutgers Tutoring Center

# **Duke University**

Durham, NC

- · Fall 2017 Spring 2020: Tutor in the Math Help Room for Linear Algebra (applied and proof-based) and Multivariable Calculus
- · Spring 2016 Fall 2019: PWild staffer: Led multi-day hiking trips for incoming Duke students and co-taught a semester-long course to train new staffers in leadership and outdoor skills

# TALKS AND PRESENTATIONS

"Computing Values of Symmetric Square L-Functions using Ichino's Pullback Formula" PRUV Final Presentation, Duke University, Spring 2020

"Segment Anything Meets Gaussian Splatting: Differentiable 3D Segmentation" Company-wide and client-facing presentation, Covar, Summer 2024

"Instagram Network Analysis with GNNs" Personal project presentation to peer group, Summer 2025

"Remote Monitoring for Wind Turbines in Rural Peru" Engineering team presentation, WindAid, Summer 2017

### SELECTED PROJECTS

### **Instagram Network Analysis**

· Scraped mutual follow data from Instagram to construct a directed social graph and visualized with **PvVis** 

· Applied GNNs (PyTorch Geometric) for link prediction; analyzed communities via Louvain clustering

Cat Identification with Neural Network from Scratch	Spring 2023
Rutgers University - Newark	Newark, NJ

- · Developed a neural network from scratch in Jupyter Notebook
- · Analyzed various network topologies and assessed the impact of activation functions on accuracy

# **PRUV** Research Project on *L*-Functions

Duke University

- · Analyzed data from mathematical databases using Sage; applied advanced linear algebra to study symmetric square *L*-functions
- · Developed and implemented code to support thesis research; presented findings to both technical and general audiences

Summer 2025

Summer-Fall 2019

$\cdot$ Work conducted through the PRUV Fellowship and senior independent study Pollack	Advisor: Dr. Aaron
<b>Differentiating Forest using Topological Data Analysis</b> Duke University	Spring 2017 Durham, NC
<ul> <li>Analyzed Lidar readings of forest canopies to determine forest characteristics</li> <li>Used topological data analysis to differentiate data</li> </ul>	
CONFERENCES ATTENDED	
Los Angeles Workshop on Representations and Geometry University of Southern California	June 2024
Masterclass: Relative Trace Formulae University of Copenhagen	August 2022
REFERENCES	
Chen Wan, Assistant Professor of Mathematics Department of Mathematics & Computer Science Rutgers University – Newark (612) 323-0079, chen.wan@rutgers.edu	

**Aaron Pollack, Associate Professor of Mathematics** Department of Mathematics University of California San Diego

(919) 660-6971, apollack@ucsd.edu