CAREER STATEMENT

MILTON LIN

Introduction

I am currently a Ph.D. candidate in Mathematics at Johns Hopkins University, working under the supervision of Professor David Gepner. My research focuses on the geometric and categorical aspects of the Langlands program, a central area in modern number theory and representation theory. My long-term career goal is to become an **academic researcher** and **educator**, contributing to advancing foundational sciences while mentoring the next generation of scientists.

Relevant Experience

Throughout my academic journey, I have been deeply engaged in pure mathematics, earning both my Bachelor's and Master's degrees from the University of Oxford. My Master's dissertation on "Index of Operators and KK-theory" was awarded the Gibbs Dissertation Prize for Mathematics. My work in the Langlands program and arithmetic geometry has resulted in two submitted arXiv preprints, and I have developed a strong network of international collaborators, including Ashwin Iyengar (American Mathematical Society), Konrad Zou (Bonn University), and Yuta Takaya (University of Tokyo).

Over the past two years, I have expanded my academic horizons by participating in graduate courses in neuroscience and machine learning. These courses covered topics such as self-supervised learning, deep learning in neuroscience, multilingual language models, and computational social science. This interdisciplinary engagement has led to collaborations with researchers from the Redwood Research Center, including Chris Hillar, and graduate students Mufan Gao and Chutong Meng from the computer science departments at Johns Hopkins University and George Mason University. These experiences have enriched my understanding of how mathematical concepts—particularly algebraic and categorical perspectives essential for the formalization of ideas—can provide valuable insights and frameworks for structured and systematic development of experiments in other fields.

Contribution to the Program

My background in pure mathematics, coupled with my interdisciplinary experiences, aligns well with the goals of the Stanford Science Fellows Program. By bringing a deep understanding of topological and algebraic theories, I aim to contribute to the program's mission of advancing and bridging disciplines in the physical, mathematical, and life sciences. I am particularly interested in applying mathematical formalism to develop structured approaches in experimental sciences.

I am committed to: 1) **Building collaborative relationships across different fields**, which is essential for tackling frontier research challenges. 2) **Creating mentorship opportunities**, an aspect of my academic life that I deeply value. I have enjoyed mentoring one Ph.D. student and more than four undergraduate students on various reading topics. As a previous Directed Reading Program (DRP) organizer at Johns Hopkins, I have cultivated a passion for supervision and education[1], which I hope to bring to the Stanford community.

Date: October 19, 2024.

[1]My teaching statement https://cwlin4916.github.io/Trees/Application/Postdoc/Teaching.pdf

Most importantly, I value diversity[2] of perspectives and experiences and believe that my unique background will contribute positively to the program's interdisciplinary community.

[2]My diversity statement: https://cwlin4916.github.io/Trees/Application/Postdoc/Diversity.pdf