Zhang Jinrui
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Dear Polymath Program Selection Committee,

Opening Statement As a third-year mathematics major at Jilin University, I am writing to express my enthusiastic interest in the Polymath Summer Research Program. My research experience in programming and optimal control and demonstrated capacity for collaborative problem-solving align closely with the program's mission to advance mathematical discovery through open collaboration.

Technical Preparation Through Optimal Control, I have developed:

- Advanced proficiency in nonlinear optimization, machine learning.

- Expertise with CMake and c/c++, python.

- Experience in Category Theroy, Functional programming, abstract algebra and group-convolutional nerual network.

My recent work on Differential Informed Auto-Encoder, resulting in a new way to find the inner structure inside dataset, is currently available on arXiv:2410.18593.

Program-Specific Alignment The Polymath initiative particularly resonates with me because of its Optimal Control, Nonlinear Optimization and Geometric Deep Learning. I am eager to contribute my expertise in programming and mathematical modeling while learning from the community's program. This experience would directly support my long-term goal to make progress in These areas.

Closing Statement I would welcome the opportunity to discuss how my background in Machine Learning and experiences in mathematical modeling could contribute to Polymath's ongoing work on . Thank you for considering my application.

Sincerely,
Zhang Jinrui