Jujian Zhang

PERSONAL DETAILS

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EDUCATION

PhD. Mathematics   `2021-Present`
Imperial College, London

MA. Philosophy with Distinction   `2020-2021`
University College, London

MSc. Pure Mathematics with Distinction   `2019-2020`
Imperial College, London

BSc. Mathematics First Class Honours   `2016-2019`
University of Bristol

RELATED EXPERIENCE

Harmonic   `2025 May - Present`

Artificial Intelligence for mathematics
> **NDA**

Project Numina   `2024-2025 April`

Artificial Intelligence for mathematics
> Auto-formalisation of combinatorics problem at the difficulty of the International Mathematics Olympiad and other mathematical competitions.

Mathlib4   `2020-Present`
Open Source Project
> I am an active contributor to Mathlib4, the largest mathematics formalisation project, which is utilized by artificial intelligence for proof searching.

Funded Study   `2018`
University of Bristol
> In 2018 summer break, I studied some topics in topology and differential manifolds under supervision of Dr. Roman Schubert.

AWARD

Schrödinger Prize   `2021`
Imperial College London
> Fully funded PhD studentship with London weighted stipend (about £60,000)

Faculty Prize Winner   `2018`
University of Bristol
> Awarded to the highest performing undergraduate students at the end of the second year of BSc Mathematics

PUBLICATION

Graded Rings in Lean's Dependent Type Theory　　　　2021
International Conference on Intelligent Computer Mathematics 2022
　　　Lecture Notes in Computer Science
Formalising the Proj Construction in Lean.　　　　2022
14th International Conference on Interactive Theorem Proving (ITP 2023)
　　　Schloss Dagstuhl-Leibniz-Zentrum für Informatik, 2023.
Formalisation of the Category of Hopf Algebras in Lean4　　2024
Mathematical Software – ICMS 2024 8th International Conference

OTHER WORKS AND WRITINGS

A Formalisation of Transcendence of e　　　　2020
Some elementary result in transcendental number theory
Identity Type under Homotopy Type Theory
with Univalent Axiom　　　　2021
An alternative interpretation of identity type in homotopy type theory
Formalising Flat Modules　　　　2022
Flat modules are of great importance in commutative algebra and algebraic geometry, this work formalised that many equivalent definitions of flatness are indeed equivalent.
Dimension Theory　　　　2023-2024
Formalising Krull dimensions of rings and topological spaces by generalising this concept to an arbitrary binary relation and other related concepts such as lengths and depth of a module. This project is also related to flatness project by famous results such as the miracle flatness theorem.
Brauer Group and Galois Cohomology　　　　2024
The group isomorphism between $\mathrm{Br}(K/F) \cong \mathrm{H}^2\left(\mathrm{Gal}(K/F), K^\star\right)$. This project includes many results in classical noncommutative algebra, Morita theory and faithfully flat modules.
Multi-graded Proj Construction　　　　2025
A generalization of Proj construction for $\mathbb{N}$-graded algebra to Proj construction for any M-graded algebra where M is an abelian group.