Bryan Fan (@BFladderbean)

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A student, developer, and independent designer exploring the intersections of mathematics, computation, and visual design, driven by curiosity about how complex systems work—and what they overlook.

Selected Research

01 Polymer Property Prediction — 2025—present

Machine learning approaches to predicting polymer properties through feature engineering, molecular representations, and ensemble models.
Keywords: Materials Informatics, XGBoost, Molecular Embeddings

Paper Link: https://drive.google.com/file/d/1I7LqRQnMde9TiYMphCRxn_UjwTn0EVIn/view?usp=sharing

02 Popularity Bias in Music Recommendation — 2026—present

Investigating how recommendation algorithms influence long-tail music exposure using 48 million user-song interactions.
Keywords: Recommender Systems, Fairness, Collaborative Filtering

Paper Link: https://drive.google.com/file/d/12ryWohrJmsaYzXs7aJrCtETol4K6LJKn/view?usp=sharing

03 Prophet — 2026—present

Exploring sample-efficient proof strategy selection in Lean through decision-making and training transfer.
Keywords: Formal Verification, Lean, Machine Learning

Paper Link: https://drive.google.com/file/d/13B4GiSegvMfw5BQ-wNGcaRP1Qtezc8MY/view?usp=sharing

04 Pic-pred — Sugar Particle Analysis — 2023—2024

Developed an image-based sugar crystal particle-size analysis tool for the Guangdong Sugarcane Research Institute, supporting quantitative analysis of particle granularity from images.

Repository Link: https://github.com/BFladderbeanawa/Pic-pred

Development

05 Blog @ bfladderbean.me — 2024—present

A self-developed website exploring minimal interfaces, experimental typography, and the intersection of technology and design.

06 HFI Utility Center @ hfiuc.org — 2023—present

A campus classroom reservation platform featuring availability tracking, booking timelines, and conflict detection.

07 Graduate Texts in Minecraft @ techmc.wiki — 2023—present

A collaborative technical knowledge project documenting Minecraft mechanics, engineering, and source-code behavior.

Honors & Awards

08 High School Mathematical Contest in Modeling

Honorable Mention	2023
Honorable Mention	2024
Meritorious	2025

09 FIRST Robotics Competition

Industrial Design Award, Shanghai Regional	2025
Autonomous Award, Istanbul Regional	2025