



XIAMEN UNIVERSITY MALAYSIA

廈門大學馬來西亞分校

AI for Mathematics — Group Project Presentation

AI4MATH: FROM NATURAL-LANGUAGE MATHEMATICS TO LEAN 4 THEOREM STATEMENTS

Tuesday 7 July 2026, 15:40–16:20, A4#G11



Members: GE TIANCHENG;

LI ENHAO;

YANG LANBO

Department of Mathematics and Applied
Mathematics,

Xiamen University Malaysia.

ABSTRACT

Our project asks how a mathematical statement written in Chinese or English can be translated into a faithful Lean 4 theorem statement for later human review. AI4Math approaches this as theorem-statement autoformalization, not proof generation. The workflow canonicalizes the input into precise English, builds a structured mathematical intent and Semantic IR, retrieves related human-accepted examples or optional external evidence, and asks an LLM formalizer to produce Lean 4 theorem-statement candidates. Each candidate is checked in Lean with a **by sorry** placeholder, so the check confirms that the statement is syntactically and type-theoretically well formed, not that the theorem has been proved or is semantically correct. A semantic validation layer then looks for hidden assumptions, wrong domains, quantifier or indexing drift, and conclusion mismatches before sending reviewable candidates to a human reviewer. The current repository contains an implemented FastAPI backend, React review interface, database-backed queue, Lean checker, validation reports, human-review endpoints, trusted retrieval, and offline benchmark fixtures, with proof generation intentionally deferred.