



THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

PhD Student Seminar

How Mathematics is Applied in DeFi and Web3

By

Mr. Van Thuat DO

Abstract

Mathematics and cryptography are fundamental foundation of Blockchain technology. Starting from Uniswap, DeFi has been growing very with several mathematical models for financial exchange and trading. Uniswap and many decentralized exchanges are Automated Market Maker - AMM models, which are based on inverse curve or integral curve. Aggregation and arbitrage trading follows with algorithms on convex optimization. This seminar briefly presents some notable applications of Mathematics in DeFi and decentralized markets. After that, it presents recently research of the author according to the following problems:

- PageRank and pairwise ranking algorithms to measure reputation score from onchain transactions;
- Clustering & visualizing Web3 groups and communities from onchain transactions;
- Supervise learning algorithms to classify ten million of smartcontracts into several defined categories (labeling problems).
- Mathematical modeling for decentralized derivative market (AMM-oriented).

The research has immediate applications in DeFi and Web3 to build commercial products:

- Reputation Ranking System in Web3;
- AMM-oriented DEX for decentralized derivative trading

Date : 12 April 2023 (Wednesday)

Time : 3:00pm

Venue : Room 4475 (Lifts 25/26)

All are Welcome!