

Koo Kim

Xi'an Jiaotong-Liverpool University / University of Liverpool Class of 2029

Year 2 Undergraduate Student | Owner and Chief Executive Officer of DELONEX

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Introduction

Energetic and enthusiastic student planning to attend Xi'an Jiaotong-Liverpool University in China as a Year 2 undergraduate student in September 2026, with academic interests in data science, computer science, technology management, artificial intelligence, mathematics, and physics. I have experience writing research papers, participating in collaborative research projects with university professors, building mathematical and physics tools, and tutoring students from Pre-Algebra through Calculus III and combinatorics. I enjoy machine learning, web and app development, software programming, and data simulation labs. I am eager to learn from experts in my fields of interest and aim to pursue a PhD in the future.

Education

- **University of Liverpool** 2028 September – 2029 June
Expected continuation pathway.
- **Xi'an Jiaotong-Liverpool University** 2026 September – 2028 May
Expected Year 2 undergraduate study.
- **Ruamrudee International School** 2025 January – 2026 June
Grade 11 – Grade 12.
 - **Grade 11 Semester 2:** AP Calculus AB/BC, AP Physics I Self Study, Biology, IB English Language and Literature SL Year 1, Multivariable Calculus through UC Berkeley Extension, Real Analysis I partner study with a senior student at Oxford.
 - **Grade 12:** AP Computer Science A, AP Macroeconomics, AP Microeconomics, AP Statistics Online, Differential Equations through Hong Kong University of Science and Technology, English Language and Research, Independent Study in AI and Machine Learning with Mathematics, PE Fitness for Life, Philosophy of Responsibility, Thai Language and Wisdom.
- **TMI Episcopal** 2022 August – 2024 December
Grade 9 – Grade 11 Semester 1.
 - **Grade 9:** Honors Geometry, Honors Physics, Honors English, Honors History, The Hebrew Scripture/The Christian Scripture, Band I, Spanish I.
 - **Grade 10:** AP World History: Modern, Honors Algebra II, Honors Chemistry, Honors English II, Creative Writing, Digital Music Composition, Spanish II.
 - **Grade 11 Semester 1:** AP Calculus AB/BC, Honors Biology, Honors English, Honors U.S. History, College Prep, Introduction to Computer Science.

U.S. High School Diploma; AP/College Preparatory Curriculum

Academic Focus: Mathematics, Computer Science, Business, Economics, Physics, Statistics, and AI/Machine Learning.

Research Experience

- **Mini Research Paper on Mathematical Game Theory via the Monty Hall Problem** 2024 June – December

Ongoing research exploring mathematical game theory and probability problems, with plans for independent publication. This project is inspired by famous probability and game theory problems, including the Monty Hall Problem and the Two Envelope Problem.

- **Alternating Permutations and The Skyscraper Puzzles Research Paper with Professor Robert W. Bell from Michigan State University** 2025 January – June
Research internship with a mathematics professor at Michigan State University on theories related to Skyscraper Puzzles, game theory, algorithms, Sudoku, combinatorics, permutations, combinations, and N-grids. The goal is to create several original problems, develop notes, upload solutions and proofs, and publish the work on my official website.
- **Additive Combinatorics and The Sidon Sets Research Paper with Professor Jozsef Balogh from University of Illinois Urbana-Champaign** 2025 September – Ongoing
Research internship with Professor Jozsef Balogh at the University of Illinois Urbana-Champaign on Sidon sets, additive combinatorics, summation algebra, inequalities, enumerative combinatorics, and computer theory. The goal is to write a 12–15 page research paper presenting conjectures, theorems, solutions, and proofs.

Relevant Experience

- **Clubs**
Robotics Club, Stock Market Club, Math Tutoring Club, Sports Marketing Club, Development and Design Club.
- **Rice University Tapia Summer Camp** 2024 July
Worked on multiple STEM projects with a focus on chemistry, biology, earth science, computer science, and mathematics. Major projects included carbon capture and computer algorithms.
- **TMI Episcopal Ewing House Quality of Life President** 2022 – 2024
Served as a student leader in a U.S. private boarding high school dormitory by assisting new students, addressing student complaints, and improving dormitory life.
- **TMI Episcopal Mathematics Teacher TA** 2023 November – 2024 March
Served as a teaching assistant for a geometry teacher and provided one-on-one and small-group tutoring in Euclidean geometry, primarily for eighth and ninth grade students, as well as several sophomores.
- **TMI Episcopal Innovation and Design Summer Camp Giveback Counsellor** 2024 June
Volunteered at a STEM-focused summer camp. Supervised and mentored younger students interested in STEM, programming, 3D printing, and graphic design. Completed 40 volunteer hours.
- **Learn to Be Mathematics Tutor** 2024 – 2025
Worked remotely as a mathematics tutor for the non-profit tutoring organization Learn To Be, teaching and guiding young students through different mathematics topics.
- **Ruamrudee International School Redeemer Dormitory Hall Mathematics Tutor** Ongoing
Volunteered as a dormitory mathematics tutor, helping students from grades 6 through 12 with regular, accelerated, AP, and IB mathematics courses.
- **Founder and Owner of DELONEX Company** Ongoing
Founder and CEO of DELONEX, a non-profit education and research initiative focused on AI, computer science, mathematics, physics, interdisciplinary coding, research, and collaboration.
- **Programmed Mathematics Tool and Physics Tool** Ongoing
Developed ATOMOS Graphing Calculator, a system designed to visualize functions and analyze mathematical expressions with precision and accessibility. Also developed CHRONOS Orbit Simulator, a physics simulation tool based on precise parameter control for comparing orbital systems.
- **Mathematics Research Projects** Ongoing
Conducting independent and collaborative mathematics research projects involving probability, game theory, combinatorics, algorithms, and mathematical problem design.

Honors, Awards, and Achievements

- **First 9th Grader in History to Solve Steiner-Lehmus Theorem at TMI Episcopal** 2022 – 2023
Became the youngest and third student in school history to solve the Steiner-Lehmus Theorem, and the first student at the school to develop three independent proofs using trigonometry, circle geometry, and parallel lines.
- **Mastered Mathematics Research Scholar** 2023 – 2024
Earned a research scholar qualification as a high school student.
- **2nd Place for Purple Comet Competition Team at TMI Episcopal** 2023 – 2024
Served as a group leader for the school team in the Purple Comet Math Meet. The competition involved challenging problems in geometry, algebra, and calculus. I primarily handled geometry problems and some calculus problems.
- **Student Subject Award at Ruamrudee International School for Grade 12** 2025 – 2026
Recipient of awards in Social Studies/Economics and Technology/Computer Science.

Skills

- **Mathematics:** Game Theory, Probability, Geometry, Additive Combinatorics, Calculus, Vectors, Discrete Mathematics, Matrices, and Combinatorics.
- **Programming:** Python, LaTeX, JavaScript, and Java.
- **Technical:** Data simulations, statistical analysis, mathematical modeling, and computational problem solving.
- **Core Strengths:** Analytical thinking, logical reasoning, creative problem solving, and independent research.

Languages

- **English:** Advanced.
- **Korean:** Fluent/Native.
- **Thai:** Beginner.
- **Spanish:** Beginner.