

Leong Ho Felix

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OBJECTIVE

Incoming HKUST Physics undergraduate passionate about quantum computing and mathematical modeling, seeking to contribute to interdisciplinary scientific dialogue through the Hong Kong Laureate Forum."

EDUCATION

- Hong Kong University of Science and Technology (HKUST)** *Expected Graduation: 2029 | Commencing: September 2025*
BSc in Science (Group A) | Extended Major in Artificial Intelligence Hong Kong SAR, China
 - Academic Focus: Physics (Primary), Mathematics (Secondary), AI Applications in Scientific Research
 - Relevant Coursework:
 - Physics: Classical Mechanics, Electrodynamics, Quantum Physics Fundamentals
 - Mathematics: Multivariable Calculus, Linear Algebra, Differential Equations
 - AI/Computational: Machine Learning for Physics Simulations, Numerical Methods, Python for Scientific Computing
 - Extended Major Highlight:
 - Integrating AI techniques (e.g., neural networks) with physics modeling (e.g., quantum system optimization).
- Pui Ching Middle School, Macau** *2019–2025*
Secondary Education Macau SAR, China
 - Academic Engagement:
 - Physics Modeling Group (2022–2024)
 - Robotics Competition Training (Project-Based)
 - Programming Course (2020–2023)

ACADEMIC ACHIEVEMENTS & COMPETITIONS

- The 10th Annual International Mathematical Modeling Challenge The Regional Contest of Greater China** 2024
Finalist (International) $\leq 7\%$ of total teams
- The 10th Annual International Mathematical Modeling Challenge The Regional Contest of Greater China** 2024
Finalist (International) $\leq 7\%$ of total teams
- The 9th Annual International Mathematical Modeling Challenge The Regional Contest of Greater China** 2023
Meritorious (International) $\leq 12\%$ of total teams
- The 9th Annual International Mathematical Modeling Challenge The International Contest of Greater China** 2023
Honorable Mention (International) $\leq 24\%$ of total teams
- 2023 High School Mathematical Contest In Modeling** 2023
Honorable Mention (International) $\leq 26\%$ of total teams

RESEARCH & PROJECT EXPERIENCE

International Mathematical Modeling Challenge (IMMC) | International Finalist (Top 7%)

2024 *Machine Learning for Household Pet Adoption Suitability Analysis*

- Designed & implemented decision tree model using Python/scikit-learn, achieving 92% accuracy with precision-tuned hyperparameters.
- Engineered key features: living space quantification, allergy impact scoring, and pet experience metrics using Pandas/NumPy.
- Conducted comparative analysis of logistic regression/SVM models, selecting decision tree for optimal interpretability.
- Developed automated data pipeline: missing value imputation, feature scaling (StandardScaler), and cross-validation.
- Outcome:** Ranked top 70/1000 teams globally through rigorous model evaluation (F1-score = 0.89).

2024 *Fair Resource Allocation System via MILP Optimization*

- Architected Mixed-Integer Linear Programming (MILP) model using Python/pulp, maximizing fairness coefficient by 38%.
- Integrated dynamic pricing prediction subsystem with numpy/itertools, enabling real-time market adaptation.
- Visualized allocation patterns using matplotlib, identifying Pareto-optimal solutions through sensitivity analysis.
- Implemented CSV-based I/O system for rapid scenario testing (20+ constraint variations analyzed).

World Educational Robot Contest (WER) | International First Prize

2023 *Autonomous Robot System Design under Resource Constraints*

- Developed low-cost collection mechanism using Lego components, achieving 95% object retrieval reliability.
- Created hybrid navigation system combining grayscale line-following and visual landmark detection.
- Implemented real-time fault diagnosis protocol, reducing competition downtime by 70% during critical rounds.
- **Technical Stack:** EV3 visual programming, sensor fusion techniques, and rapid prototyping methodologies.

Technical Methodologies

Modeling Decision Trees, MILP, Sensor Fusion, Dynamic Systems Analysis

Tools Python (scikit-learn/pulp/Matplotlib), EV3 Robotics Suite, Data Wrangling (Pandas)

Process Cross-validation, Hyperparameter Tuning (GridSearchCV), Real-time System Debugging

SKILLS

- **Programming Languages:** Python, MATLAB, C++, LaTeX, MATHEMATICA
- **Physics & Mathematical Tools:** Advanced Calculus (Self-taught), Quantum Mechanics Simulations, Numerical Analysis, Statistical Modeling
- **Data Analysis & Scientific Computing:** Python Data Analysis (NumPy/Pandas), MATLAB Simulations, Qiskit (Quantum Computing), OriginLab
- **Research & Academic Skills:** Physics Proficiency, Experimental Design, Academic Writing, Technical Report Composition
- **Problem Solving & Leadership:** Critical Problem Solving (IMMC/HIMCM), Team Leadership, Interdisciplinary Collaboration, Scientific Presentation
- **Specialized Areas:** Theoretical Physics Modeling, Robotics Algorithms, Differential Equations, Chaos Theory Applications
- **Learning Competencies:** Self-directed Learning, Mathematical Intuition, Computational Thinking, Creative Problem Reformulation