# Tim (Peng-Jen) Chen

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## Education

**National Taiwan University, Taiwan**

- **M.S.** in Communication Engineering — Expected 2027
- **B.B.A.** in Information Management (Dual Degree) — Sep. 2023 – Aug. 2025
  - DS & CS-related Courses GPA: 4.23/4.3 (52 credits)
  - Courses: Operations Research, Machine Learning, Big Data Analysis, Algorithms, System Designed and Analysis, Operating System, Social Media Analysis
- **B.S.** in Mathematics — Sep. 2020 – Aug. 2025
  - Rank: 24/64
  - Overall GPA: 3.34/4.3
  - Courses: Calculus, Linear Algebra, Probability, Cryptography, Differential Equations, Computational Mathematics, Financial Engineering

**Keio University, Japan**

- **International Exchange Student** in International Center — Mar. 2025 – Aug. 2025
  - Courses: Essential Japanese, Game Theory, Econometrics, Probability and Statistics

## Projects & Research

**GitHub Community's Reversi** — Jul. 2025 —

- Built an interactive Reversi game hosted on GitHub using issues as the UI and GitHub Actions as the game engine
- Designed Python-based game logic, move validation, board rendering, and leaderboard tracking through commit history
- Automated turn-based gameplay via GitHub Actions, enabling global users to play Reversi collaboratively or against a DQN-trained AI agent

**Rock-Paper-Scissors-Lizard-Spock (RPSLS) Reinforcement Learning Arena** — Jun. 2025 —

- Developed RL agents and Heuristic agents to play RPSLS more strategically across various environments
- Analyzed agents performance by visualizing heatmaps of battles between deterministic agents and trained agents
- Built a streamlit app allowing users to play RPSLS against RL agents

**100 Prisoners Problem Simulator** — Jun. 2025 —

- Designed a streamlit app and command-line interface to simulate the generalized prisoners problem (e.g. different number of boxes can be opened)
- Implemented strategies such as cycle-following and shift to solve the problem
- Graphically demonstrated the strategies' workings and simulation results in the streamlit app

**gamealloc** — May 2025 —

- Developed a Python package to address resource allocation problems in game theory
- Implemented classical algorithms like Sequential Priority and Top Trading Cycle
- Created APIs for detecting Pareto efficiency, verifying strategy-proofness, and suggesting preference manipulation for specific agents

**Performance Evaluation Considering Carbon Emission Permit Trading** — Aug. 2023 – Mar. 2025

- Constructed mathematics models for performance evaluation with stochastic non-parametric envelopment of data (StoNED) method
- Verified the robustness of StoNED method was greater than traditional DEA
- Provided insight with taking U.S. Electricity in 2022 as illustrative example

**InsightLink (collaborated with professor in California State University, Bakersfield)** — Dec. 2023 – Dec. 2024

- Developed a GraphRAG-based news content analysis tool, leveraging LLMs for insight extraction from datasets and reducing manual effort in social science research
- Applied NLP techniques to analyze attitude in groups (e.g. professions, races) toward Atlanta spa shooting in 2021

**Cost-sensitive Feature Selection for Support Vector Machines** Sep. 2023 – Dec. 2023

- Devised a classifier with minimum feature selection cost without damaging performance too much
- Gave an extension with a model that the true positive rate and true negative rate were embedded in the objective function
- Used SVM with custom objective; reduced feature count by $90\%$ while maintaining True Positive Rate not less than 0.85
- Conducted sentiment analysis using various thresholds to evaluate the impact on result accuracy

**Quantitative Trading & Sentiment Analysis** Dec. 2022 – Mar. 2023

- Designed and implemented an automated trading system for cypto under given strategies
- Collected information in real time by twitter APIs and Performed sentiment analysis using RoBERTa-based NLP models
- Created a new Cypto Volatility Index to predict probable trend about the specific crypto

**E2FA (Exponential two factors algorithm)** Mar. 2023 – Jun. 2023

- Designed an algorithm to determine the value of orders to each platform with considering "Time Decay" and "Platform Ratio"
- Proposed marketing strategies for different groups, which were clustered by age, gender, or other tags to assist the company in making better decision

**Sneaked Spam** Oct. 2022 – Dec. 2022

- Proposed a method that to modify the content of ads to make them not to be detected as spams, which decreased the model recall by $50\%$ (more than $50\%$ spam sneaked)

**Bus Timetable Rescheduling** Mar. 2022 – Jun. 2022

- Handled real data provided by Capital Bus, which included cards ID, timestamps, get in stops, get off stops
- Designed a Heuristic algorithm to indicate which shifts should be removed under constraints
- Minimized the dissatisfaction of passengers which was designed by over 100 responses to our questionnaire

## Publication

***Robust-Optimization-Guiding Deep Reinforcement Learning for Chemical Material Production Scheduling*** 2024

- Published on *"Computers and Chemical Engineering"*
- Used Robust Optimization (RO) to guide Deep Reinforcement Learning (RL) to solving the scheduling problem in Chemical Engineering Factory
- Improved the robustness of results and convergence rate of RO

## Work Experience

**T.A. in Programming Designe, NTUIM** Sep. 2025 – Dec. 2025

- Set questions for 10 assignments and 2 exams, and wrote corresponding solutions with rigorous mathematical statements
- Verified 10 assignments, and 2 exam papers for about 110 undergraduate students
- Set 2 hours office hours per week to assist students in reviewing lecture materials

**T.A. in Management Mathematics, NTUFIN** Sep. 2023 – Dec. 2025

- Set questions for 10 assignments and 2 exams, and wrote corresponding solutions with rigorous mathematical statements
- Verified 10 assignments, and 2 exam papers for about 110 undergraduate students
- Set 2 hours office hours per week to assist students in reviewing lecture materials

**Undergradute R.A. in Productivity Optimization Lab, NTUIM** Jul. 2023 – Aug. 2024

- Researched in Stochastic Non-parametric Envelopment of Data with multiple outputs
- Researched in setting price of carbon emission permit
- Researched in Reinforcement Learning

**T.A. in Operations Research, NTUIM** Feb. 2024 – Jun. 2024

- Verified 4 assignments and 1 exam paper for more than 100 undergraduate and graduated students and write corresponding solutions with rigorous mathematics statements
- Set 10 hours office hours in English to assist students in doing assignments.

**T.A. in Programming for Business Computing, NTUIM** Feb. 2024 – Jun. 2024

- Set questions for 2 coding assignments and write corresponding solutions with clear comments
- Verified 7 coding assignments for more than 400 undergraduate and graduated students

**Marketing Intern in klook** Feb. 2024

- Integrated links in blogs and saved the blogger information in database automatically with python and shell script

## Extracurricular Activities

**International Exchange Student in Keio University, Japan** Mar. 2025 – Aug. 2025

- Enrolled in courses across microeconomics, econometrics, and Japanese society to broaden international academic exposure
- Enhanced cross-cultural communication and adaptability through living and studying in a Japanese-speaking environment
- Built a professional network with international students and professors, fostering global perspectives in research and collaboration

**Operations Research Study Group in IEDO Lab, NTUIM** Jul. 2022 – Sep. 2022

- Studied operations research papers to gain advanced knowledge in the field, mainly focus on Scheduling Problems
- Discussed about scheduling problems in any given scenarios

**The 36th and 37th Hyacinth – Hometown Care Camp, NTUCY** 2021, 2022

- Organized a 4-day camp for children at rural elementary schools
- Allowed students to learn while having fun through educational activities and games
- Managed a budget of more than 100K NTD, ensuring transparent expense reporting and timely reimbursements

## Awards

**WorldQuant BRAIN 2023** — Top 20% Team Globally Jun. 2023
**2023 coding 101** — Bronze award Mar. 2023
**Collegiate Programming Examination** — Professional Mar. 2023

## Skills

**Programming** Python, C++, SQL, Shell Script
**Tools** Git, LaTeX, Linux
**Fields** Operations Research, Data Analysis, Applied Mathematics, Reinforcement Learning
**Languages** Mandarin (native), English (TOEFL 90), Japanese (basic)