Curriculum Vitae/Resume

Ying Tu

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KEY SKILLS

- **Analytical skills** demonstrated in the international APCChE Chem-E-Car Competition
- **Leadership and teamwork skills** evidenced through extracurricular activities
- **Organizational skills** demonstrated in my research for my master's thesis

EDUCATION

National Taiwan University Taipei, Taiwan
MSc in Chemical Engineering Sept. 2019 - Jan. 2022
- Overall GPA: 4.18/4.30
- Thesis: Development of Hybrid Hydrogels and its Applications in Wound Healing

National Taiwan University Taipei, Taiwan
BSc in Chemical Engineering Sept. 2015 - June 2019
- Overall GPA: 4.15/4.30
- Major GPA: 4.26/4.30
- Ranking: 7^{th}/114
- Academic Excellence Awards: Top 5% of the class in 3 different semesters

WORK EXPERIENCE

National Taiwan University Taipei, Taiwan
Unit Operations Teaching Assistant Sept. 2019 - June 2020
- Supervised more than 30 students on experiment setup and execution
- Implemented experiment plans amongst the students by reviewing them during the class
- Arranged TA hours for students to open up further discussions about experiments
- Filtered and collected feedback from students to improve the quality of the course

RESEARCH EXPERIENCE

Polymer Nanomaterials Laboratory Taipei, Taiwan
Graduate Student Sept. 2019 - Jan. 2022
- Studied in Prof. Dai's team and developed hydrogels for wound healing applications
- Prioritized 2 most important requirements and tuned a total of 12 parameters to find the optimal process condition
- Led a team of 5 members for 6 months, conducting in *vivo* experiments on wound healing using a rat model
- Developed hydrogels that perform 2 times the healing efficacy of commercial products

APCChE Chem-E-Car Competition Hong Kong, China
Team Member Feb. 2017 - Aug. 2017
- Developed a battery using an Iodine clock reaction to run the vehicle model at the desired distance
- Analyzed huge experiment data for 6 months to revise the design of the vehicle
- Communicated with the team to decrease the size of the vehicle by 20%
- Won the most innovative-design award in the competition with 8 teams in total

EXTRACURRICULAR ACTIVITIES

Osaka University Exchange Program Osaka, Japan
Exchange Student Sept. 2021 - Jan. 2022

- Worked on a team of 3 international students to create an 8-minute acting performance
- Delivered a 10-minute speech to introduce my own country to 20 middle school students
- Served as an English mentor to a Japanese student to strengthen his English skill

CTCI Youth Leadership Program New Taipei City, Taiwan
Team Leader July 2019 - Aug. 2019

- Proposed an eco-friendly business model using biodegradable hydrogels to replace commercial plastic packaging
- Organized workload and distributed tasks to team members to complete the model and the presentation in 2 days
- Created a 16-page presentation and delivered a 15-minute speech to 50 audiences
- Won first place award and received $2,500 in prize money

Basketball Team of Chem. Eng. Dept. Taipei, Taiwan
Team Leader Sept. 2017 - Sept. 2018

- Designed training plans and schedules including shooting, defense, and workouts
- Led the team to win 1 national chemical engineering basketball championship

SKILLS and INTERESTS

Computer:

- **Machine Learning**
  1. Applied the Deep Q-learning model to train the AI to land a virtual lunar lander on the moon safely
  2. Built a sequential deep learning model and make accurate predictions on house prices
  3. Used third-party APIs such as Instaloader, Pandas, and NumPy for web-crawling and data cleansing Christmas-related posts on Instagram
- **Data Analysis**
  1. Utilized Pandas, Numpy and Matplotlib to visualize the data for data preprocessing
  2. Used third-party API Instaloader for data crawling and cleansing Christmas-related posts on Instagram in a team project
- **Web**
  1. Built multiple web applications with interactive user interfaces using React.JS
  2. Used Django and FastAPI framework for the backend systems to take requests from frontend and handle CRUD operations
  3. Designed a simple and robust web calculator with HTML, CSS, and JavaScript
- **Game Design**
  1. Implemented domain analysis and functional programming principles using Racket to create the “Space-Invaders” game
  2. Leveraged object-oriented design principles in creating the “Don’t-Touch-the-Wall” game written in the Jack programming language.
  3. Applied game loop and frame rate control in JavaScript to build a bouncing ball game
- **System**
  1. Wrote “Jack Compiler”, “VM translator”, and “Hack Assembler” programs to convert high-level Jack language to low-level machine code in the course “Build a modern computer from first principles from Nand to Tetris
  2. Learned and Applied design patterns for assignments in the course “Software Design and Architecture”

Languages: Chinese, English (fluent, TOEFL 108/120), Japanese (fluent, N1 certificate)

Interests: basketball, hiking, workout, video games, video editing

ONLINE COURSES

Stanford University and DeepLearning.AI's Specialization Certificate in Machine Learning - Coursera (Aug. 2022)
- Learned neural networks and decision trees in building supervised learning models
- Used unsupervised learning techniques in clustering and anomaly detection
- Built a movie recommender system using the content-based deep learning method
- Applied reinforcement learning model to train a virtual lunar lander to land on the moon

UBCx's Verified Certificate in Software Engineering: Introduction – edX (Aug. 2022)
- Learned and contrasted different software development processes such as Waterfall, Spiral, and Agile
- Applied the role-goal-benefit concept to design user stories and how to decompose user stories into UML diagrams
- Learned the methodologies of unit tests like Black box and White box testing
- Understood the role of refactoring to build a high-quality system

UBCx's Verified Certificate in How to Code – edX (July 2022)
- Identified how to develop program requirements and build tests
- Learned how to use abstraction and recursion to write clean code and solve complex problems such as Sudoku puzzles and Cantor set
- Designed a space invaders arcade game using the functional programming language Racket and combined all course materials into a complete project

University of Alberta's Specialization Certificate in Software Design and Architecture - Coursera (June 2022)
- Explored object-oriented modeling principles and expressed models as UML diagrams
- Identified suitable low-level design patterns to address common design issues
- Learned the basics of REST architecture and identified its design principles

University of Washington's Course Certificate in Programming Languages - Coursera (May 2022)
- Applied functional programming techniques in writing robust, reusable programs
- Implemented a small programming language with function closures inside Racket
- Compared the difference between OOP and functional decomposition
- Enhanced a Ruby-based Tetris game by adding new functionalities to the source code

GTx's Professional Certificate in Applications of Linear Algebra - edX (May 2022)
- Learned to compute the determinant of a matrix and its application, such as finding the area of regions
- Learned to construct an eigenspace of a matrix and used it to characterize a matrix
- Applied Markov chains to model real-world problems such as Google PageRank and characterized their long-term behaviors
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GTx's Professional Certificate in Introductory Linear Algebra – edX (Mar. 2022)
- Evaluated mathematical expressions to compute quantities that deal with linear systems
- Learned to apply matrix algebra and LU factorization to solve matrix equations
- Applied matrix algebra to solve and analyze the Leontief input-output model

Stanford Online's Verified Certificate in Algorithms: Design and Analysis - edX (Mar. 2022)
- Learned the definition of Big-O notation to describe the limiting behavior of a function
- Learned algorithms like sorting, graph search, shortest path, and dynamic programming
- Applied algorithms to solve tasks such as DNA sequence alignment and text justification
- Mastered different data structures like hash tables, heaps, balanced search trees, and bloom filters and learned when to use them.