Yuan Chang

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Education

- **University of California, San Diego** — La Jolla, California
  Master of Science - Computer Science and Engineering; — *Sept 2022 - June 2024*
  Emphasis: *Artificial Intelligence*
- **University of California, Davis** — Davis, California
  Bachelor of Science - Computer Science; GPA: 3.9/4.0 with Honors — *Sept 2018 - June 2022*
  Minor: *Mathematics*
  Courses: *Operating Systems, Data Structures, Analysis of Algorithms, Artificial Intelligence, Machine Learning, Scientific Computation, Computer Architecture, Optimization, Number Theory, Modern Algebra, Linear Algebra*

Internship & Experience

- **UC Davis Applied Mathematics Summer Research** — Remote
  Research Student — *June 2021 - Feb 2022*
  - Developed automated systems that compute undiscovered mathematical constants.
  - Used symmetric breaking and optimization techniques to reduce the search space by 6x.
  - Optimized the computation to achieve almost 10x improvements in source generation.
  - Research conducted under the supervision of Prof. Jesús De Loera and William Wesley.
- **International Family Union** — Remote
  Teaching Associate (Part-time) — *June 2020 - Jan 2021*
  - Improved my student's grade in data structure course from failing to well above average.
  - Designed and taught areas such as Unix/Bash commands, C++, algorithms and abstract data structures.
  - Introduced advanced topics such as dynamic-memory management and recursion, as preparation for future courses.

Projects

- **Time Series Analysis on SNP Stock Market(Machine Learning, Data processing, Time Series Models)**: Training polynomial regression and time series models to predict the trend of the SNP stock market. Final model achieved around 90% accuracy. Project collaborated with 6 other fellow CS students, served as team leader. Produced an interactive model using Flask to output market projections. Github Link (2022)
- **Digit Recognition with MNIST Dataset of Handwritten Digits(PCA, Centroid Algorithm)**: Analyzed and implemented Centroid and PCA algorithms in MATLAB for hand-written digit recognition. Training data set over 60,000 digits and testing data set over 10,000. Achieved overall success rate of around 85%. (2022)
- **Computations with Rado numbers and degree of regularity(Automated Reasoning, Theory of Computation, Number Theory, Combinatorics)**: Advancement in terms of Rado Numbers and the degree of regularity. Discovery of nearly 500 new mathematical constants. Results collected and formulated into research paper accepted into 2022 ISAAC conference. Co-author with Prof. Jesús De Loera and William Wesley. Github Link (2021)
- **Robotic Arm Project(Algebraic Geometry, Grobner Bases, Automatic Theorem Proving, Kinematic Problem)**: Study of a specialized 2 segments robotic arm with computational geometric algebra. Analysis of many real life robotic arm problems such as kinematics singularity and reversed kinematics problems. Cross referenced with 3 industry research papers. Paper Link (2020)

Volunteer Experience

- **UC Davis Undergraduate Research Conference Presentation** — Davis, California
  Ramsey Theory and Automatic Theorem Proving. Presentation Link. — *Oct 2021*
- **Teaching Assistant for Robotics Class at Davis Senior High** — Davis, California
  Taught essential programming paradigms through the language RobotC to a class of 30. — *Sept 2019 - Dec 2019*

Publications

- **Rado Numbers and SAT Computations (with J. A. De Loera and W. J. Wesley).**
  Proceedings of the 47th International Symposium on Symbolic and Algebraic Computation (ISSAC 2022). Pages 333-342, available online at https://dl.acm.org/doi/10.1145/3476446.3535494.

Honors and Awards

- UC Davis L&S Dean's honor's list of W2019, F2019, W2020, S2021.
- UC Davis Provost Award and undergraduate scholarship - September, 2018

Skills Summary

- **Languages(Proficient)**: Python, C++, LaTeX, MATLAB, R, Bash
- **Languages(Familiar)**: Rust, Swift, Clisp, Prolog, Perl, Java, Maple
- **Libraries**: Scikit, TensorFlow, Keras, Seaborn, pandas, NumPy, SymPy