Yuan Chang (Merlin)

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Education

- **University of California, San Diego** — La Jolla, California
  Master of Science - Computer Science and Engineering; GPA: 3.97/4.0 — *Sept 2022 - June 2024*
  Courses: *Artificial Intelligence, Software Engineering, Reinforcement Learning, NLP, Convex Optimization*
- **University of California, Davis** — Davis, California
  Bachelor of Science - Computer Science; GPA: 3.9/4.0 with Honors — *Sept 2018 - June 2022*
  Minor: *Mathematics (Number Theory, Modern Algebra, Linear Algebra, Numerical Optimization & Scientific Computation)*
  Courses: *Operating Systems, Data Structures, Algorithms Design, Artificial Intelligence, Machine Learning, Computer Architecture*

Internship & Experience

- **Amazon AWS Summer Internship** — Seattle, WA
  Software Developer Engineer — *June 2023 - Sep 2023*
  - Part of the High Performance Computing team that delivers large scale computing clusters for complex workflows.
  - Designed and implemented internal APIs that configure computing instances with cluster management and job scheduling systems.
  - Developed database managers which queried a single-table DynamoDB storing both cluster and node level data.
  - Incorporated unit, integration and load tests into the CI/CD production pipeline to ensure workflow validity.
  - Cross-teams collaboration to deliver seamless integration of workflows and secure API consumption.
  - AWS Tools involved: Lambda, DynamoDB, EC2, S3 storage
- **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.

Projects

- **Terminal UI board-game in Haskell(Haskell, functional programming, QuickCheck, Monad)**: Implementing the TUI version of the classic board-game, Mastermind, in Haskell. Monadic and functional programming. Implemented 10 QuickCheck property testings. 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)

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, Java, Bash
- **Languages(Familiar)**: Haskell, Rust, Swift, Clisp, Prolog, Perl, R, Maple
- **Libraries**: Scikit, TensorFlow, Keras, Seaborn, pandas, NumPy, SymPy, Pytorch