Bryan (Yu) Zhou

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Education

University of California, Los Angeles (UCLA) Sept 2019 - Present
B.S. Computer Science and Applied Mathematics, Class of 2023

- **Major GPA: 3.97/4.0**
- Overall GPA: 3.95/4.0
- Dean's Honors List (All Quarters)
- GRE: 330/340

Research Experience

Structures-Computer Interaction Laboratory at UCLA Samueli School of Engineering Aug 2020 - Feb 2021
Undergraduate Researcher with focus on:

- Using C++ to design a 2D LiDAR-based passage identification and navigation algorithm. The accuracy of classifying road-boundaries outperforms Multi-Ransac and Pearl by 30%. Python is used first to implement a development version of the algorithm.
- Improved the previous algorithm to perform odometry with an EKF(Extended Kalman Filter), fusing data from IMU, Robot-Wheel-Encoder, Lidar and Monocular Camera.
- Building and configuring a simulated operable robot model on RViz and Gazebo to generate training data for the SLAM algorithm. The model receives and displays odometry results from the EKF.

Knowledge Engineering Group (KEG) at Tsinghua University Dept. of Computer Science Jun 2021 - Present
Undergraduate Researcher with focus on:

- Building and training two prediction models with BERT(Chinese) in PyTorch: model A predicts whether two news reports are referring to the same event (95% accuracy), and model B predicts whether two events are correlated, and thus belong to the same story line (89% accuracy)
- Combining these two models in an algorithm, we could process massive Chinese language news streams scraped from media reports and generate a tree of correlated news events that show the relationships and development of current events.
- Publication: Iterative Strict Density-Based Clustering for News Stream, Published in China Conference on Information Retrieval, 2021 (a new approach for detecting fine-grained topics in an evolving news stream)

Skills

Languages:

- Python, C/C++, R, Shell Script, JavaScript, Markdown/Latex, Lisp

Machine Learning:

- PyTorch, NumPy, Pandas, Matplotlib, Scikit-learn, TensorFlow

Web Dev:

- Backend: Node.js, MongoDB, Mongoose, Express.js, JWT
- Frontend: React.js, HTML & CSS

Other Tools:

- Linux Cloud and Ubuntu, Git, ROS

Relevant Coursework

- **Computer Science**: Deep Learning for Computer Vision, Machine Learning with Applications, Data Structures, Algorithms and Complexity, Fundamentals of Artificial Intelligence, Software Development Laboratory, Object Oriented Programming, Computer Organization and Systems Architecture, Data Mining (IP)
- **Math/Stats:** Real Analysis, Complex Analysis, Advanced Linear Algebra, Numerical Analysis, Multivariable Calculus, Differential Equations, Discrete Mathematics, Probability, Mathematical Statistics, Statistical Programming, Optimization (IP), Stochastic Processes (IP)

Projects

***Goal-Bruins*:** A full stack web application: An interactive goal planner that allows users to create, follow, and archive their personal goals. Users can socialize with each other using follow/like/comment features. Frontend uses React.js with HTML and CSS. Backend uses Node.js, Express API and MongoDB Database. Uses JWT for user authentication.

***Character-Recognizer*:** A two layered (784-400-26) Neural Network implemented using PyTorch that can recognize alphabetical characters with 0.9733(SGD optimizer)/ 0.9987(Adam optimizer) accuracy when running on randomized test data. Uses cross-entropy-loss as optimization criterion and sigmoid as activation function.

***Facial-Recognizer*:** Two clustering algorithms using Kmeans and Kmedoids to match photos of the same celebrity taken at different occasions. The photos are processed with PCA to extract eigenfaces and reduce complexity. Then use Kmeans or Kmedoids to cluster photos based on similarity.

***Mini-Rogue*:** A C++ game project that utilizes multi-level inherited classes interacting with one another. Uses recursive style maze traversing algorithms to optimize non-player-character movements. Operates on STL containers (Vectors/Lists) to store and modify game NPC characteristics.

Extracurriculars

Affiliations: CSSA-Outreach-UCLA, ACM-AI-UCLA
Interests: Badminton, Travelling, Piano, Cooking