Yuhao Zhang

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EDUCATION

- **University of California, San Diego** — La Jolla, CA
  PhD in Computer Science; GPA:3.8; Advisor: Prof. Arun Kumar — *Sept. 2017 – June. 2023(expected)*

  Courses taken: Advanced Compilers, Principles of Programing Languages, Database Systems, Advanced Algorithm, Machine Learning, Data Mining & Analytics, Advanced Data Analytics, Computer Vision, Introduction to Robotics

- **Nankai University** — Tianjin, China
  BS in Theoretical Physics; GPA: 3.8 — *Sept. 2012 – June. 2016*

PROFESSIONAL EXPERIENCE

- **ADALab, University of California, San Diego** — La Jolla, CA
  PhD research, deep learning systems — *Jan. 2018 - Present*
  - **Panorama**: Presented Panorama, the first Software 2.0 system to enable and optimize unbounded vocabulary computer vision queries. The prototype is implemented with Python and TensorFlow. Example applications include face recognition, pedestrian re-identification, car model recognition, animal species recognition, etc.
  - **Cerebro**: Presented Cerebro, a scalable system for high-throughput reproducible neural network model selection. With a novel form of parallel ANN training called model hopper parallelism that exploits a formal property of stochastic gradient descent (SGD), the approach improves both throughput and reproducibility. It is easy to integrate with existing ANN tools; a prototype has been built to support both TensorFlow and PyTorch.

- **Opera Solutions** — San Diego, CA
  Data Scientist Intern, machine learning based scheduling system — *Summer 2018*
  - **Testing and optimizing**: Tested and analyzed a production machine learning-based scheduling system for cinema theaters. Optimized the parallel programming model and IPC mechanisms, resulting in over 50% of improvement in execution time(from over 4h to 2h per run)
  - **Migration to Hadoop**: Migrated the existing R, Python and C++ based single node applications to Hadoop ecosystem for distributed computing. Redesigned the data source layer to reduce the MySQL data warehouse I/O overheads, with over 90% of improvement
  - **Scaling up**: Mitigated communication overheads that led the application to be unscalable, increasing the capacity of the system from 80 jobs to 200~300 as the customer requested, concluding the 10-month-long project in 3 months

- **Texas A&M University** — College Station, TX
  Research Intern, pattern recognition — *Summer 2015*
  - **Object tracking and pattern recognition**: Developed applications for object tracking and chaotic chemistry pattern recognition on MATLAB. Hand-labeled over 100h of video and trained a MLP. The model was deployed on over 5M images with ~ 70 % accuracy

COURSE PROJECTS

- **Compiler Implementation**: 1. Implemented a mini-ML interpreter in OCAML. 2. Implemented a dataflow analysis framework and several analysis such as brach bias, liveness, reaching definition and may point to, for LLVM IR
- **Whales Classification**: Applied XGBoost on whales classification and achieved over 70% accuracy, with 4M echo-location clicks emitted by whales processed with Spark
- **Stock Analytics**: Conducted 2D visualization and categorization of tickers with PCA and XGBoost, with over 85% accuracy
- **Autonomous Driving Robot**: Developed a control library in Python for a Raspberry-Pi-based robot platform, including vision-based control and navigation via pose estimation with landmarks, localization and mapping via EKF-SLAM, and planning&coverage algorithms for implementing a Roomba-like robot

PUBLICATIONS

Y.-H. Zhang and X.-Q. Li, *Three-generation neutrino oscillations in curved spacetime*, Nucl. Phys. B **911**, 563 (2016) [hep-ph/1606.05960]

C. Liu, Y. -G. Miao, Y. -M. Wu and **Y.-H. Zhang**, *Self-regular black holes quantized by means of an analogue to hydrogen atoms*, Adv. High Energy Phys. **2016**, 5982482 (2016) [hep-th/1511.04865]