Daisy Wang

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Education

Washington University in St Louis US Jan 2024 - Present
PhD Student, Computer Science

Washington University in St Louis US Aug 2021 - Dec 2023
Master, Computer Science GPA 3.95/4.00

Central South University China Aug 2008 - Jun 2012
Bachelor, Electrical Engineering

Research Experience

Washington University in St Louis US Jan 2023 - Present

Real-Time Particle Distribution Estimation with FIMS (Fast Integrated Mobility Spectrometer)

- Developed a C++ multithreading real-time pipeline for FIMS instrument analysis and a complementary Python visualization tool.
- Integrated seamlessly with LabVIEW for data acquisition, addressing memory-sharing intricacies between LabVIEW and C++.
- Enhanced system performance, ensuring optimized data processing speed and stability on Raspberry Pi 4 in accordance with real-time benchmarks.

Drone-Based Real-Time Airborne Sensing

- Conducted research on real-time airborne gas distribution estimation using drones, focusing on adaptive sampling, Gaussian plume modeling, and Bayesian inference.
- Built estimation pipelines integrated with ArduPilot SITL simulations.
- Developed different sampling strategies (e.g., downwind pyramidal coverage, adaptive bounding boxes, ROI-based searches) to improve gas source localization.

Telescope Search for Gamma-Ray Bursts Using Likelihood Maps

- Developed multiple telescope search algorithms based on real-time gamma-ray burst likelihood maps, aiming to maximize cumulative likelihood coverage within strict timing and budget constraints.
- Accounted for telescope dynamics such as slew rate and dwell time in the optimization process.
- Analyzed trade-offs between competing strategies in terms of computing time, likelihood coverage, and overall efficiency under deadline-driven scenarios.

Bayesian Modeling and Performance Optimization for Atmospheric Simulation (GEOS-Chem)

- Worked with the GEOS-Chem High-Performance (GCHP) model to analyze MPI profiling data and identify performance bottlenecks in large-scale atmospheric chemistry simulations.
- Investigated load balancing strategies to improve model scalability and computational efficiency across distributed systems.

Courseworks & Projects

Object Detection & Classification

- Investigated and Implemented YOLO, Faster R-CNN, DETER, and RetinaNet on an ImageNet dataset.
- Used pre-trained models for improved performance via transfer learning

Social Media Web Development

- ❖ Crafted an Instagram-like platform with capabilities for user registration, login/logout, post creation/ editing/deletion, post likes/comments, and user subscriptions.
- ❖ Developed using React.js (frontend), Express (backend), and MongoDB

Implementation of Pinochle and Texas Hold'em Card Game

- ❖ Utilising Multi-Paradigm Programming in C++ to implement two poker games, Pinochle and Texas Hold'em

Parallelise Path Finding Algorithms

- ❖ Design parallelised approach for five popular path finding algorithms, Bread-First Search, Uniform-Cost Search, A* Search, Fringe Search and Ripple Search, and speed up the algorithms by multithreading

Implementation of A Restaurant Recommendation System

- ❖ Using Singular Value Decomposition to a restaurant recommender system based on Yelp Dataset
- ❖ The recommendation system could give top-N similar restaurants to a given restaurant (content-based filtering) or top-N restaurants a user may like according predicted rating (collaborative filtering).

Skills

- ❖ Programming Languages: C++, C, python, javascript, php, java, html, css
- ❖ Libraries & Frameworks: OpenCV, Boost, PyTorch, Karas, React, Node.js, express
- ❖ Command-line Scripting Skills in Unix/Linux
- ❖ Other Skills: switching/routing/WLAN, TCP/IP

Conferences & Publications

Real-time Analysis Pipeline for FIMS Instrument: Poster Presentation at the American Association for Aerosol Research (AAAR) 2023 Conference. [9IM.23]

Sudvarg, Marion, Daisy Wang, Jeremy Buhler, and Chris Gill. "Subtask-Level Elastic Scheduling." *45th Real-Time Systems Symposium (RTSS)*. 2024.

Sudvarg, Marion, Ao Li, Daisy Wang, Sanjoy Baruah, Jeremy Buhler, Chris Gill, Ning Zhang, and Pontus Ekberg. "Elastic Scheduling for Harmonic Task Systems." *30th IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS'24). IEEE Computer Society Press.*, 2024.