

Zongnan Bao

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EDUCATION

- **University of California, Los Angeles (UCLA)** Los Angeles, CA
Master of Science in Computer Science; GPA: 3.73/4.00 Sep. 2021 - June 2023
- **University of Illinois at Urbana-Champaign** Urbana, IL
Bachelor of Science in Computer Engineering; GPA: 3.74/4.00 Aug. 2017 - May 2021

EXPERIENCES

- **Dolby Laboratories, Inc.** Los Angeles, CA
Image Engineering Intern June 2022 - Dec. 2022
 - Designed, developed and unit-tested a modular system for restoring image metadata from HDR/SDR pair using **Particle Swarm Optimization** (PSO).
 - Accelerated optimization process by 30× using **multiprocessing** and intelligent down-sampling.
 - Wrote benchmarks for the system, visualized results using **Plotly**, deployed on server using **Dash**.
 - Implemented, trained and evaluated deep learning papers in the fields of **HDR** and **photo enhancement** using **PyTorch**.
- **YITU Technology** Hangzhou, China
Research Intern - Computer Vision Feb. 2021 - May. 2021
 - Trained and evaluated **Single Shot Multibox Detector** (SSD). Experimented with the model design and hyper-parameters, achieved recall rate around 80% under 1% False Alarm Rate.
 - Wrote scripts in Python and Bash that can extract potential training images from entire unlabeled image database, increased recall rate by 5%.
 - Automated task submission pipeline, saved at least 70% of time compared to previous process.
 - Wrote and assessed annotation guidelines for object detection tasks.

PROJECTS

- **Focus Stacking - Image Processing Tool**
 - Developed a tool to blend images with different depths of focus into an "all-in-focus" image.
 - Utilized **Laplacian Pyramid Decomposition** for image fusion and reconstruction, achieved better visual/quantitative result than simple blending methods.
 - Application include photography and microscopic imaging to produce a better quality image.
- **LazyTrip - Smart Travel Planner**
 - Developed backend functionalities in **RESTful API** using **Django REST Framework** (DRF).
 - Integrated **Google OAuth** into the backend's JWT Token based authentication system.
 - Developed **KMeans**-based greedy scheduling algorithms and **Google Map API** for travel route planning.
 - Fully documented and unit-tested APIs, deployed app on **Heroku**.
- **Connection-based UDP Server & Client:**
 - Designed and implemented server and client application that utilized extra header protocol to extend **UDP** with lossless, connection-based and multi-client transmission.
 - Utilized C++ POSIX **socket API** for underlying connections. Designed server and client in object-oriented way.
 - **Containerized** server and client applications in Docker and be able to easily deploy on machines.

SKILLS

- **Programming Languages:** C/C++, Python, Bash
- **Libraries:** PyTorch, Django, NumPy, Matplotlib, Plotly, CUDA, OpenMP, MPI, nosetests
- **Others:** L^AT_EX, Git, AWS, Linux, Socket Programming, Agile, Adobe Lightroom, **Photography**