ZONGNAN BAO

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EDUCATION

University of California, Los Angeles (UCLA)

M.S. Computer Science

Graduation: June 2023 (Expected) Los Angeles, CA

University of Illinois Urbana-Champaign

B.S. Computer Engineering **GPA: 3.75/4.00**

Graduation: May 2021 Champaign, IL

- **Honors**: Deans List (Spring 2020, Fall 2019, Spring 2018)

WORK EXPERIENCES

YITU Technology

Research Intern - Computer Vision

Feb 2021 – May 2021 Hangzhou, China

- Assessed several tasks that can be solved using object detection algorithms, wrote documentation that guided for image annotation.
- Trained and evaluated SSD object detection models. Experimented with the model design and hyperparameters, achieved Recall ≈ 80% under False Alarm Rate constrained to 1% after revising model using error analysis.
- Wrote scripts in Python and Bash that can extract potential training images from entire image database, increased recall by ∼ 5% and reduced at least 90% of image annotation work. Wrote scripts that automates request for image annotation, saved at least 70% of time compared to previous process.

Python | Bash | Computer Vision | Object Detection

RESEARCH EXPERIENCES

Coordinated Science Laboratory

Undergraduate Research Assistant - Advised by Prof. Sayan Mitra

May 2020 – Aug 2020 Champaign, IL

- Designed and implemented a python package that utilized backend of C2E2 for reachability analysis.
- Applied C2E2 to verify safety of an autonomous vehicle scenario: vehicles following a series of waypoints.
- Fixed bugs and added new functionalities to C2E2 software such as deterministic transition and a drop-down option for a new verification method.
- Presented newly-designed functionalities to 10+ group members; a part of the presentation was recorded as a tutorial.

Python | C++ | Reachability Analysis | Autonomous Vehicles

SKILLS

- **Programming Languages**: Python, C++, C, Shell Script
- **Libraries**: PyTorch, Tensorflow Keras, Numpy, Matplotlib, Django
- **Others**: LaTeX, Markdown, Linux, Adobe Lightroom, Photography

PROJECTS

Focus Stacking

Oct 2020 – Dec 2020 Champaign, IL

- The tool can be used to blend images with different depths of field into an "all-in-focus" image.
- Utilized Laplacian Pyramid Decomposition for image fusion and reconstruction, achieved better visual/quantitative result than simple blending method.
- Can be applied to landscape photography or microscopic images to produce a clearer result.

Python | OpenCV | Laplacian Pyramid

BioFaceNet Re-implementation

Aug 2021 Los Angeles, CA

- Re-implemented the paper: BioFaceNet: Deep Biophysical Face Image Interpretation in Pytorch, where the original implementation was in Matlab.
- Provided both local and online (Google Colab) scripts for training and predicting.
- Compared the result which aligns with the paper.

PyTorch | Face Interpretation | UNet

Go Rent! - A Well-designed Leasing Platform for Students

May 2020 – Aug 2020 Champaign, IL

- Developed a website for UIUC students to share leasing information and to search for housing rentals near campus.
- Implemented the backend using Django, Support user registration, log-in/out, user profile.
- Utilized MySQL as the database to store user and house information.
- Designed with modern and user-friendly frontend interface.

Django | Backend | Website Design

Operating System

Feb 2020 – May 2020 Champaign, IL

- Designed to support multiple devices, file system, paging, multi-tasking, signals and scheduling etc.
- Implemented processing control block (task_struct), filesystem driver, etc.
- Collaborated with multiple team members for a half semester-long project.

OS | Linux | C