Zongnan Bao

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Education

- **University of California, Los Angeles (UCLA)** — Los Angeles, CA
  Master of Science in Computer Science — *Sep. 2021 - June 2023*
- **University of Illinois at Urbana-Champaign** — Urbana, IL
  Bachelor of Science in Computer Engineering — *Aug. 2017 - May 2021*

Experiences

- **Qualcomm Technologies, Inc.** — San Diego, CA
  Camera System Architect — *July 2023 - Present*
  - Performed system-level modeling for Image Signal Processor (ISP) architecture designs.
  - Developed framework/tools in Python to help manage dataflows and facilitate architectural explorations.
  - Conducted cross-team communications and collaborations to finalize and align design proposals.
- **Dolby Laboratories, Inc.** — Los Angeles, CA
  Image Engineering Intern — *June 2022 - Dec. 2022*
  - Designed, developed and a system for automatic tuning for Dolby Vision tone-mapping process using Particle Swarm Optimization (PSO), the project turned into a patent.
  - Developed benchmarks and visualization dashboards using Plotly and Dash for faster tuning evaluation.
  - 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.
  - Developed scripts to extract training data from unlabeled image database, results in +5% recall rate.
  - Automated ML task submission pipeline, saved at least 70% of time compared to previous procedure.

Projects

- **Learning Sequential Image Enhancement in Bilateral Space**
  - Proposed a novel deep learning model architecture for image enhancement, combining sequential image processing and bilateral grid learning methods for faster runtime and lower memory consumption.
  - Evaluated on the MIT-Adobe-5K dataset with a PSNR of 24.22, SSIM of 0.906, LPIPS of 0.043.
  - Implemented, trained and evaluated the model in PyTorch, documented experimentations (e.g. loss functions, pre-train datasets & model archs) in technical reports.
- **Focus Stacking - An Image Enhancement 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 compared to max Laplcian of Gaussian method.
  - Implemented in Python, documented design, quantitative & visual evaluation in detail

Skills

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