Yunpeng Xu

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EXPERIENCE

Senior Software Engineer – Perception, Hyundai-Aptiv Joint Venture, Pittsburgh, PA Feb. 2020 - Present

- Principal contributor for designing and developing radar pipeline (radar driver, unfolding algorithm, radar tracking and visualization)

Senior Software Engineer, Aptiv, Pittsburgh, PA Feb. 2018 - Jan. 2020

- Principal contributor for designing developing the next-generation, high-performance map infrastructure for planning, perception and localization needs, including semantic and spatial map APIs.
- Lead the design, development, and optimization for sensor drivers (radar, camera), and bring-up of new vehicle platform.
- Designed, implemented and integrated the black channel framework for message infrastructure to detect message transmission errors (tampered, spoofed, corrupt, missing, etc.) for infrastructure certification stack.
- Extensive code-reviews, software design and review across teams to make sure folks are on the same page for a new design and implementation, and will be able to deliver the best software product.

Research Assistant, CyLab, Carnegie Mellon University, Pittsburgh, PA May. 2017 - Aug. 2017

- Built an OpenCV-based real-time moving object detection application with four fisheye cameras on NVIDIA TX1 and TI TDA2x ADAS platforms, successfully brought up the system and deployed it on a real vehicle.
- Evaluated application performance, decreased each frame's processing time by 23.5% after optimization using CUDA.

System Application Engineer, Ambarella Inc., Shanghai, China Oct. 2015 - Jul. 2016

- Designed and implemented a smart rate control library for Ambarella's S2L and S3L SDK, supported AVC/HEVC.
- Efficiently improved video compression ratio while maintaining video quality, later ported to Apple's HomeKit service.
- Designed and implemented Netlink module to transfer messages between kernel and user-space process.

Embedded Software Engineer, Galaxycore Inc., Shanghai, China Jul. 2014 - Sep. 2015

- Core Linux device driver developers for Galaxycore's video surveillance SOC.
- Implemented device driver for digital imaging sensors, and AVC and JPEG decoding modules using V4L2 framework.
- Optimized device driver for image signal processing (ISP) and AVC encoding modules based on V4L2 framework.

EDUCATION

Carnegie Mellon University, School of Computer Science Pittsburgh, PA
Master of Science in Embedded Software Engineering, QPA: 3.51/4.0 Sep. 2016 - Dec. 2017

University of Science and Technology of China Hefei, China
Master of Biomedical Engineering, Medical Device, GPA: 86.03/100 *Sep. 2011 - Jul. 2014*
Bachelor of Electronic Information Science and Technology, GPA: 86.42/100 *Sep. 2007 - Jul. 2011*

RELEVANT PROJECTS

Parallel Optimization (C/C++, CUDA), Pittsburgh, PA Apr. 2017 - May. 2017

- Designed an elastic web server on a pool of machines; exploited multi-thread execution and cache locality; optimized load balancing and scaling strategy for different requests, successfully meeting latency requirements for 98.8% requests.
- Designed and implemented a galaxy evolution simulator using both Barnes-Hut algorithm and Morton-Code algorithm, and achieved 10x speedup by using performance bottleneck analysis and CUDA acceleration.

Parallel Computing Techniques (C/C++) Jan. 2017 - Apr. 2017

- A parallel CUDA render that draws colored circles - designed and implemented data structures that can be efficiently constructed and manipulated in parallel but still maintaining operations' order and atomicity.
- Implemented and paralleled page rank algorithm, top-down and bottom-up BFS algorithms using both openMP and MPI. Handle cache coherent and shared data structures issues to achieve required performance.
- Designed and implemented a parallel server that efficiently takes advantage of a single node's processing resources and also elastically adapts to variations in input request stream load.

SKILLS

Programming Languages: C++ (Boost, Eigen, PCL), Python (Numpy) > C, Java, Bash, Matlab
Frameworks: CUDA, ROS, Android, OpenCV, OpenMP, MPI, ISPC
Tools: Git, CMake, Conan, Easyprofiler, Gtest, GDB, Scrum, Jira