Yunpeng Xu

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EXPERIENCE

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

- Radar tracker development and optimization: implemented a radar tracker to manage tracking cycle calls and orders (initialization, data association, update, predict and termination), profiling and latency measurement of the pipeline.
- Developed a non-tracker based radar unfolding algorithm by using data association between two consecutive scans.
- Leading a team of 3 engineers to bring up traffic light detection system for new platform, including requirement gathering, pipeline design, and algorithm implementation.
- Utilized modern GPU techniques including TBB, CUDA to speed up computation time of the LiDAR pipeline modules.
- Release manager for perception: defined code development process, coordinated with team leads to ensure the delivery of quality package releases.

Senior Software Engineer - Software Infrastructure, Aptiv, Pittsburgh, PA Feb. 2018 - Dec. 2019

- Principal contributor for designing & developing the next-generation, high-performance map infrastructure for planning, perception and localization needs, including semantic and spatial map APIs.
- Led 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.
- Conducted extensive design doc and code reviews to ensure the work delivered by the team is of high quality.

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.

SKILLS

Programming Languages: C++ (Boost, Eigen), Python (Numpy) > C, Java, Bash, Matlab
Frameworks: CUDA, ROS, TBB, Android, OpenCV, OpenMP, MPI, ISPC
Skills: Computer Architecture, Algorithms, Agile Methodology, Embedded system
Tools: Git, CMake, Conan, Easyprofiler, Gtest, GDB, Scrum, Jira, LaTeX

EDUCATION

Carnegie Mellon University, School of Computer Science Pittsburgh, PA
Master of Science in Embedded Software Engineering Sep. 2016 - Dec. 2017
University of Science and Technology of China Hefei, China
Master of Biomedical Engineering, Medical Device *Sep. 2011 - Jul. 2014*
Bachelor of Electronic Information Science and Technology *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.