SANDEEP KOTA

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SUMMARY:

Experienced Computer Vision Engineer with 3 years of experience in the automotive and robotics industry, specializing in software development for autonomous systems like drones and vehicles. Proficient in C++ for embedded development, Python for ML and CV rapid prototyping, and skilled in ROS. Demonstrated success in optimizing solutions to enhance autonomy and functionality, committed to staying current with industry advancements, and passionate about advancing technology in computer vision and robotics.

WORK EXPERIENCE:

Continental Automotive Systems — **Auburn Hills, MI**
Computer Vision Engineer — **Oct 2021 - Present**
• Core member of the Trailering Applications team - Responsible for implementing computer vision software for different vehicle platforms.
• Implemented computer vision algorithms to detect trailer angle for Trailer Reverse Assist feature, currently in production on 2023 year pick-up truck.
• Improved keypoint tracking algorithm thereby increasing angle accuracy metric by 10% and enhancing reliability in harsh lighting conditions.
• Engaged in agile software development, implementing software in C++, tests using gtest, performing code reviews and maintaining release artifacts.
• Research and development of proof of concept prototype for trailer pose using state-of-the art models in depth estimation, pose estimation, NeRF, etc.
• Developed trailer angle estimation architecture for L4 fallback path project with Aurora Trucks.

Infovision Inc — **Dallas,TX**
Robotics Engineer — **May 2021 - Oct 2021**
• Core member of the Robotics Division - Responsible for POC's of autonomous drones based warehouse inventory management.
• Hands-on project involving building drone hardware, implementing visual odometry in OpenCV and controls using ROS and PX4 autopilot.
• Coordinated development of path planning algorithm from octomap using A* algorithm and dynamic obstacle avoidance using stereo depth.
• Spearheaded the implementation of version control by establishing a remote repository enabling CI/CD pipeline for remote development team.

Flux Auto (Autonomous Trucks for India) — **Bengaluru, India**
Robotics Engineer — **Oct 2018 - May 2019**
• Key contributor of the Software Engineering team - contributed at various levels of software from embedded layer to the application layer.
• Initiated development of a lighter U-Net based lane detection algorithm improving lane detection accuracy by 8%, with about 10% reduced params.
• Designed and implemented a comprehensive data collection pipeline for autonomous trucks, leveraging rosbag data structure to capture information.
• Developed and implemented an online calibration procedure to ensure precision and accuracy in data collection during drive scenarios.

Harvard Medical School - Shafiee Lab — **Bengaluru, India**
Research Intern — **Dec 2017 - Jun 2018**
• Co-authored papers in reputed journals on the applications of deep learning in healthcare. Notable publications include:
1. "An inexpensive smartphone-based device for point-of-care ovulation testing", Lab on a Chip, 2019
2. "Development and evaluation of inexpensive automated deep learning-based imaging systems for embryology", Lab on a Chip, 2019

PROJECTS:

Agile Robotics for Industrial Automation Competition (ARIAC) - *[ROS, Gazebo, C++, git]* — **github**
• Simulated order handling task in a large manufacturing warehouse environment using ROS and modern C++.
• Developed a robust control system for a gantry robot with two UR-10 arms to tackle several agility challenges. Agility challenges include sensor blackout, picking from conveyor belt, faulty gripper, removing faulty parts, processing priority shipments, dynamic obstacle avoidance.

SKILLS:

Robotics: ROS (Robot Operating System), Robot Kinematics and dynamics, Control Systems, Robot Programming, SiL & HiL testing
Machine Learning: Pytorch, Tensorflow, NumPy, Scikit-Learn, MLOps (Weights & Biases)
ML Concepts: Pattern Recognition, Clustering, Regression, CNN, Transformers, Model Evaluation
Computer Vision: Multi-View, Object Detection, Segmentation, Depth Estimation, OpenCV
Software Tools: Gazebo, RViz, Foxglove, Docker, Git, Jenkins, Docker
Programming Languages: C++, Python

EDUCATION:

University of Maryland — **College Park, MD**
Master of Engineering, Robotics — May 2021
Relevant coursework : Software Development for Robotics, Statistical Pattern Recognition, Path Planning, and Advanced Computer Vision.

SASTRA University — **Thanjavur, India**
Bachelor of Technology, Mechatronics — Sept 2018