

Experience

Perception R&D and Autonomous Driving

Aug '18 – Present

Algolux, Canada

As the robotics team lead, I'm responsible for designing and leading the development of visual odometry, sensor fusion, localization, mapping, and prediction-planning-control module integration for the AD stack of this Montreal-based startup. Some of the tasks I've worked on are: multi-object tracking, 3D object detection from monocular video, monocular visual odometry, and lidar/camera sensor fusion. Most recently, I've been setting up a ROS2 based AD platform for data capture and testing, with functionality from perception to control, deployed on a drive-by-wire R&D vehicle

C++11/14 | Python3 | TensorFlow | TensorRT | CUDA | ROS2 | OpenCV | PCL | Linux | Git

Perception and Sensor Fusion for Autonomous Driving

Apr '17 – Aug '18

TomTom, Netherlands

Part of TomTom's Autonomous Driving division. My focus is on the vehicle's perception which includes processing, analyzing, and fusing data from sensors to facilitate localization and mapping. Methods involve a combination of conventional non-linear probabilistic state estimation, as well as supervised deep learning. I work primarily with monocular camera sensors, and often handle lidar, radar, GPS, and IMU data

C++11/14 | Python3 | TensorFlow | ROS | TensorRT | CUDA | Drive PX2/DriveWorks | RTMaps | OpenCV | PCL | Linux | Git

Laser Scanning Pipeline for μm Precision Metrology

Sep '16 – Mar '17

Nikon Metrology, Belgium

As a part of the system software team, my responsibility was to design and develop low latency scan data pipelines for industrial metrology laser scanners. This involved writing enterprise grade, time critical C++ code for filtering processes like 3D speckle and curvature reflection filters

C++11/14 | PCL | MSVC | microsoft/GSL | PowerShell | Subversion

LIDAR based Navigation in Featureless Environments

Jan '16 – Aug '16

DFKI Bremen, Germany

As part of my master's thesis, my work addressed the localization issues faced when navigating craters, caves, and featureless landscapes in the context of autonomous space exploration. I developed algorithms for deploying lidar reflective artificial landmarks which aided SLAM based on scan matching and custom graph optimization. Besides reducing scene ambiguity, these methods fostered data association, loop closure, localization, and mapping

C++11 | Python3 | g2o | PCL | OpenCV | ROS | Rock RTOS | Git

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Monocular Visual Inertial Navigation

Apr '15 – Apr '16

Rovsing A/S, Denmark

As a student software engineer, I helped build a monocular camera based visual inertial navigation application using extended kalman filter (EKF), Harris corner detector, and KLT tracker. The project aimed for GPS-less navigation and used data from a monocular camera and an IMU. My work also involved accelerating the algorithm on the Nvidia Tegra's GPU

C++11 | Python2 | CUDA | Magma | Eigen | Qt | Subversion

Perception and Localization for Mobile Robots

Jan '15 – May '15

DTU EE, Denmark

I worked with robot perception in a competitive setting using monocular cameras and kinect sensors, map building with 2D laser scanners, and path planning. Particle filter based localization and occupancy grid SLAM techniques were used for rapid scene understanding

C++03 | OpenCV | Matlab | Simulink | Bash | Git

Research Interest

Mobile Robot Perception

Real-time perception pipelines with Visual SLAM, multi-sensor fusion, state estimation, and machine learning inference. I'm especially interested in applications at the intersection of machine learning and mobile robotics

Education

Jul '14 – Aug '16

Master of Science

EE, Automation and Robot Technology
Technical University of Denmark
Lyngby, Denmark

Jan '16 – Aug '16

Master of Science (Thesis)

Robotics Innovation Center
German Research Center for -
Artificial Intelligence (DFKI GmbH)
Bremen, Germany

Jun '15 – Dec '15

Master of Science (Exchange)

EE, Computer Control and Automation
Nanyang Technological University
Nanyang, Singapore

Jul '10 – Jul '14

Bachelor of Technology

Electrical & Electronics Engineering
NITK Surathkal
Karnataka, India