

IBRAHIM ABDELMONEM

Senior Software Engineer

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EXPERIENCE

Software Integration Engineer

Kudan

11/2021 - Ongoing Bristol, UK

- Created and maintained ROS/ROS2 packages for Kudan's SLAM Libraries.
- Developed the Backend of KudanStudio application using Python web frameworks.
- Created Python bindings for Kudan's C++ Libraries.
- Supported DevOps team in maintaining ROS CI.
- Developed Kudan's AMR package and the examples launch files.
- Prepared Robotics demos for conventions like ROSCon and customers.
- Continuously evaluated the SLAM algorithms against customer datasets.
- Supported customer in integrating the ROS packages and tune the SLAM parameters in their existing systems.
- >_ Key Technologies: SLAM, C++, ROS, Python

R&D Software Engineer

Avelabs

09/2018 - 11/2021 Cairo, Egypt

Contributed to the development of Avelab's new Acoustic sensing product (AutoHears) by optimizing and porting existing algorithms to C/C++ for deployment on embedded hardware.

- Optimized existing Beamforming and DOA algorithms by offloading the slow mathematics computations to TI DSPs.
- Created benchmarks for the new developed algorithms.
- Created ROS packages for the product.
- Collected datasets to validate our algorithms against it.

Developer Advocate For Yonohub.com (A cloud-based system for Autonomous Vehicles, ADAS, and Robotics).

- Created tech content for publication as articles, tutorials, and showcase apps to effectively demonstrate use cases of Yonohub.
- Developed new Blocks from the state of the art ML/DL and ADAS Algorithms.
- Configured Hardware for Local Deployment (Nvidia Jetson AGX Xavier, Raspberry Pi).
- Created AVS Datasets for Yonohub, e.g. KITTI, DeepDrive, ApolloScape and Comma.ai
- >_ Key Technologies: Autonomous Vehicles, ROS, ML/DL, Cloud, Embedded Boards

Motion Planning and Control Engineer (Contractor)

AeroVect

11/2020 - 11/2021 Remotely

- Developed and implemented the motion planning and control software stack for The AeroVect Driver.
- Designed and developed safety and emergency stopping algorithms for The AeroVect Driver to ensure safe operation in all scenarios.
- Designed and executed simulations for testing and verification of The AeroVect Driver, ensuring accuracy, robustness and reliability of the system.
- Integrating ROS with the other software components.
- >_ Key Technologies ROS, C++, Control Theory, Autonomous Driving

EDUCATION

BSc. Mechatronics Engineering

The German University in Cairo

2018 Cairo

- Excellent with Honors

ONLINE DEGREES

Robotics Software Engineer Nanodegree Certificate — Description

- ROS Essentials.
- Localization.
- Mapping and SLAM.
- Path Planning and Navigation.

Sensors Fusion Nanodegree - Udacity Certificate — Description

- Lidar Obstacles Detection, Plane Segmentation and PointsCloud Clustering.
- Camera and Lidar Fusion.
- Radar Obstacle Detection.
- Kalman Filters.

C++ Nanodegree - Udacity Certificate — Description

- C++ Foundations.
- Object-Oriented Programming (OOP).
- Memory Management.
- Concurrency.

PROGRAMMING LANGUAGES

C++ Python Rust Java MATLAB

FRAMEWORKS AND LIBRARIES

- ROS/ROS 2
- Eigen3
- g2o
- Ceres
- Flask & Fast API
- PyBind11
- OpenCV
- Conan The C++ Package Manager

EXPERIENCE

Bachelor Thesis and Internship

Daimler AG - Mercedes-Benz R&D

📅 02/2017 - 08/2017

📍 Sindelfingen, Germany

- Developing a Test Robot for Touch Devices Testing.
- Hardware (Robot Construction, Kinematics and Touch Devices)
- Software (CANoe, CAN-bus, Databases and The Test System)
- Making Tests on The Touch Devices with the Robot to analyze the state and develop improvements.
- Implementing new Algorithms and Data structures for the Robot in MATLAB.
- Programming a Graphical User Interface for the System
- >_ Key Technologies: Delta Robots, MATLAB, CANoe .

PROJECTS

- Edrak. C++ Library for Visual SLAM. [GitHub](#)
- Pure pursuit ROS package for path tracking. [GitHub](#)
- C++ Implementation of a Blockchain. [GitHub](#)
- ngrok-ros. ROS package for ngrok. [GitHub](#)
- ros2-android, ROS2 package to use android's phone sensors. [Github](#)
- ROSbag2Videos, Extract videos from ROS bags. [Github](#)
- Teaching an online ROS2 course on Youtube. [Playlist](#)
- pclutils a C++ library for working with PointClouds. [Github](#)
- BaristaBot a robotics simulation package based on ROS and Gazebo. [Github](#)
- CarSim SFML and ROS based Car Simulator. [Github](#)
- Concurrent Traffic Simulation. [Github](#)
- Linux System Monitor C++. [Github](#)
- Route Planning Project using A* C++. [Github](#)
- Unscented Kalman Filter to estimate the state of multiple cars. [Github](#)
- Particles Filter C++ Implementation. [Github](#)
- Time To Collision System (TTC) based on Lidar and Camera. [Github](#)
- PointClouds Obstacles Detection, Segmentation and Clustering [Github](#)
- Jupyter-ROS (Contributor) ROS Support for jupyter notebooks [Github](#)
- Longitudinal and Lateral Control in CARLA Simulator [Github](#) — [Video](#)
- Deep Reinforcement Learning DQN Agent Playing Space Invaders [Github](#) — [Video](#)
- Road Semantic Segmentation Using Fully Convolutional Network (FCN) [Github](#)
- Building and Simulating TurtleBot using ROS and Raspberry Pi [Github](#) — [Video](#)
- Optimal LQG Control of Wind Turbine using Kalman Filter
- Non-Linear Controller (Feedback Linearization) for 2D Plotter Robot Arm
- PID Control of Two-Wheeled Self balancing Robot . [Video](#)
- Yu-Gi-Oh Video Game in Java [Github](#) — [Video](#)

HONORS & AWARDS

Academic Achievement Full Scholarship

The German University in Cairo

📅 2013-2018

📍 Cairo, Egypt

Ranked 7th in Thanwya Amma (High School)

The Egyptian Ministry of Education

📅 2013

📍 Cairo, Egypt

TECHNOLOGIES



ONLINE COURSES

- State Estimation and Localization for SDC
- Introduction to Self-Driving Cars
- ROS1x: Hello (Real) World with ROS
- Electric and Conventional Vehicles
- Machine Learning with TensorFlow on GCP
- Python Parallel Programming Solutions
- Intro to FPGA Design for Embedded Systems
- Agile Software Development
- Control of Mobile Robots

LANGUAGES

- Arabic ★★★★★
- English ★★★★★
- German ★★★★★