

# IBRAHIM ESSAM ABDELMONEM

## Algorithms Engineer.

@ ibrahim.essam1995@gmail.com    +201027410918    Cairo, Egypt  
in <https://www.linkedin.com/in/ibrahimessam>    [github.com/HemaZ](https://github.com/HemaZ)    [ibrahimessam.com](https://ibrahimessam.com)



## EXPERIENCE

### R&D Algorithms Engineer

#### Avelabs

01/2021 - Ongoing

Cairo, Egypt

- Working on Avelab's new Acoustic sensing product (AutoHears).
- Porting existing algorithms from Python and MATLAB to C++.
- Optimizing and enhancing current algorithms performance.
- Deploying the Algorithms on Embedded hardware like TI TDA2PXEVM.
- Creating benchmark for the current algorithms.
- collecting ground truth data to validate our algorithms against it.
- Creating ROS packages for the product.
- >\_ Key Technologies: DSP, ROS, C++, Python, Sensors fusion, Embedded Boards

### Planning and Control Engineer (Contractor)

#### AeroVect

11/2020 - 01/2021

Remotely

- Developing The motion planning and control software stack.
- Integrating low level control on the vehicle.
- Developing simulations for testing and verification.
- Integrating ROS with the other software components.
- >\_ Key Technologies Path Tracking, ROS, Control, Autonomous Driving

### Yonohub Developer Advocate

#### Avelabs

09/2018 - 12/2020

Cairo, Egypt

- Developer Advocate For Yonohub ( A cloud-based system for Autonomous Vehicles, ADAS, and Robotics [yonohub.com](https://yonohub.com) ).
- Creating tech content for publication as articles, tutorials and showcase apps to effectively demonstrate use cases of Yonohub.
- Developing new Blocks from the state of the art ML/DL and ADAS Algorithms.
- Preparing Hardware for Local Deployment (Nvidia Jetson AGX Xavier, Raspberry Pi).
- Preparing AVS Datasets for Yonohub, e.g. KITTI, DeepDrive, ApolloScape and Comma.ai
- >\_ Key Technologies: Autonomous Vehicles, ROS, Autoware, ML/DL, Cloud

### Bachelor Thesis and Internship

#### Daimler AG - Mercedes-Benz R&D

02/2017 - 08/2017

Sindelfingen, Germany

- Develeoping 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, CAN bus

## 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++

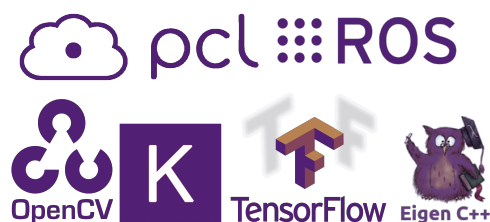
Python

Java

MATLAB

Bash

## FRAMEWORKS AND LIBRARIES




# PROJECTS

- Pure pursuit C++ ROS package for path tracking. [GitHub](#)
- 2D Position and Velocity Kalman Filter in C++ with python bindings. [GitHub](#)
- ROS package for ngrok to expose local ports to the Internet. [GitHub](#)
- Author of "Intro. to ROS2" Guided project. [Coursera](#)
- ROSbag2Videos, Extract videos from ROS bags. [Github](#)
- Author of 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 fusion. [Github](#)
- PointClouds Obstacles Detection, Segmentation and Clustering using PCL [Github](#)
- PyCarMaker (Contributor) Python interface for IPG CarMaker. [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 ★★★★★