Saif Haj Salem

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SUMMARY

Recent graduate in Electrical Engineering, specializing in embedded system and computer vision. I am committed to providing creative ideas that advance the field and have a strong desire to contribute to cutting-edge projects.

PROFESSIONAL EXPERIENCE

END OF STUDY PROJECT: Improving Annotation Efficiency for Object Detection in P-Guard Robot Using Active Learning Strategies **Feb 2024 – July 2024**

Enova Robotics, Sousse, Tunisia

- Conducted comprehensive research into the latest Active Learning Techniques for object detection.
- Developed and trained an object detection model, preparing and integrating the robot's dataset while implementing data cleansing strategies.
- Evaluated and tested the model's performance, leveraging both Active Learning and Supervised Learning.
- Designed an interactive web dashboard using HTML, CSS, JavaScript and Flask.
- Integrated manual annotation functionalities into the dashboard.

Keywords: AI, Active Learning Techniques, Python, PyTorch, Cuda, SSD, Docker, TensorRT, Deepstream.

SUMMER INTERNSHIP: Perception of the environment for a robot **July 2023 – Aug 2023**

ACTIA Engineering Services, Ariana, Tunisia

- Development of an algorithm for robot and implementing Obstacle Avoidance Using Lidar.
- Implementing SLAM with Slam toolbox to generate a Map and Making Robot Navigation with NAV2.
- Implementing Hokuyo Lidar UTM-30lx-EW, Radar TI IWR6843AOPEVM and Depth Camera Intel RealSense D435I with ROS 2 and Visualizing Point Clouds.

Keywords: Python, OpenCV, ROS 2, SLAM, NAV2, Ubuntu.

ACADEMIC PROJECTS

Develop a simulated autonomous navigation system for a self-driving car **Novembre 2023**

- Simulate realistic environments using CARLA and implement automatic vehicle control.
- Visualize multiple sensors, including four cameras, one LiDAR and one Semantic LiDAR.

Keywords: Carla Simulator, Python, OpenCV, YOLOv5, Visual Studio Code.

Perception for self-driving car: Plane Segmentation and Obstacle Clustering in Point Clouds Generated by LIDAR **May 2023**

- Working with Point Cloud Data using the Point Cloud Library (PCL), including streaming PCD files.
- Segmenting the Road from non-road points by fitting a plane using RANSAC.
- Grouping points using Euclidean Clustering via kd-trees to find obstacles.
- Fitting oriented bounding boxes over clustered obstacle points to simplify tracking and collision avoidance.

Keywords: C++, ROS, PCL, RANSAC, kd-trees, Visual Studio Code, Ubuntu.

Precisely identifying and measuring object distances using Deep Learning **Feb 2023**

- Implemented the Mask R-CNN model for accurate object detection and segmentation.
- Utilized RealSense SDK for depth estimation and precise distance measurement of detected objects.

Keywords: Python, OpenCV, Intel RealSense D435i, Mask R-CNN, PyCharm.

Image Processing Project **Feb 2023**

- Image Preprocessing: Noise Reduction, Contrast Enhancement, Normalization and Filtering.
- Image Analysis: Edge Detection, Object Segmentation, Morphological Operations.

Keywords: Python, OpenCV, PyCharm.

Design and Realization of an Electronic Board for an Audio Amplifier **November 2023**

- Schematic Design.
- PCB Layout and Routing.
- Component Placement and Soldering.
- Continuity Testing.

Keywords: LM386, Audio Jack 3.5 mm, Proteus.

Parking System **November 2022**

- Developed parking system to monitor the availability of parking spaces.

Keywords: Raspberry Pi 3 B+, LCD, Infrared sensor, Python, Proteus, OpenCV.

Creation of an intelligent anti-gas protection system **Feb 2021**

- Designed and developed an intelligent gas protection system.

Keywords: STM32F401RE, GSM808, Buzzer, Gas sensor MQ2, STM32CubeIDE.

EDUCATION

National engineering degree in electrical engineering **Sept 2021 – July 2024**

National Engineering School of Monastir, Tunisia

Preparatory Engineering Cycle **Sept 2019 – July 2021**

Preparatory Institute for Engineering Studies of Sfax, Tunisia

SKILLS

- **Programming Languages:** C, C++, Python, MATLAB/Simulink, ROS1/ROS2.
- **Deep Learning Frameworks:** PyTorch.
- **Model Optimization:** TensorRT.
- **Edge AI Deployment:** NVIDIA Jetson.
- **Computer Vision:** OpenCV, YOLO, SSD, Mask R-CNN.
- **Version control:** Git, GitHub, Bitbucket, SourceTree.
- **Containerization & Virtualization:** Docker.
- **Simulation Platforms:** Gazebo, Carla Simulator.
- **Operating Systems:** Windows, Ubuntu.

LEADERSHIP

ENIM Team Tunisia - Shell Eco Marathon **Dec 2022 – Dec 2023**

Embedded Software Engineer | Electrical Project Manager

AWARDS

CRIEEE Challenge **March 2023**

Monastir, Tunisia

- First Prize: 24-hour challenge of “Mobile Development”, “AI”, “Robotics”.

LANGUAGES

- English: Intermediate.
- Frensh: Intermediate.
- Arabic: Native.