

PERSONAL INFORMATION



Eliyas Kidanemariam Abraha

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 <https://github.com/eliyaskidnae>

Sex Male | Date of birth 03/10/1995 | Nationality Ethiopian

WORK EXPERIENCE

July 15, 2024 -

Robotics Software Intern

farming revolution GmbH, Böhmenkirch (Germany) (<https://farming-revolution.com>)

- Develop software components used in simulation and on physical robots
- Support robot operators and farmers remotely
- Designed and implemented essential helper functions to enhance robot localization, path planning, and navigation, improving the accuracy and efficiency of autonomous operations.
- Curve fitting with RANSAC for robust weeding robot path optimization, camera-LiDAR fusion for enhanced perception and navigation

sector Agricultural Robotics

Feb 5, 2020- 2023

System Developer

Lion International Bank, Mekelle (Ethiopia) (anbesabank.com)

- Design and Implement Optimized Algorithm
- Collaborating with hardware engineers to integrate software with hardware components, ensuring seamless communication and control.
- Analyze, design, code, debug, test, documents, implement and maintain business and client facing applications
- Develop digital systems for quick and easy transactions which facilitates the activities of the bank.

sector Technology, finance

Sep 10, 2018 – Feb 5, 2019

Internship

iCog Labs, Addis Ababa (Ethiopia) (www.icog-labs.com)

- Utilized image processing algorithms and computer vision libraries such as OpenCV to improve system performance.

sector Information Technology

EDUCATION AND TRAINING

Sep 10, 2023 –

Erasmus Mundus Joint Master In Intelligent Field Of Robotic System(IFRoS)

University of Girona, Girona (Spain) -Land and Marine Robots (www.ifrosmaster.org)

Main Modules (Semester I):

- Autonomous Systems
- Machine Learning
- Multiple View Geometry
- Probabilistic Robotics
- Robot Manipulation

Main Modules (Semester 2):

- Hands on Intervention
- Hands on Localization
- Hands on Planning
- Hands on Perception
- Robot Operating System

Eötvös Loránd University-Autonomous systems & Mobile Robotics

Main Modules (Semester III):

- Deep Neural Network Development
- 3D Sensing and Sensor Fusion
- Intelligent Field Robots Lab
- Methods and tools for AI Applications

09/2014-7/2019

B.Sc. in Computer Science and Engineering (Engineering), a Five-year Programme

Very Great Distinction
Average = 3.92/4.0

Mekelle University - Mekelle Institute of technology, Mekelle (Ethiopia)

- Had Studied Artificial Intelligence, Neural Network, Computer graphics, computer architecture, algorithms and data structures, Embedded System, Computer Networking, computer security and Cryptography, software engineering, human-computer interaction and microprocessor

PERSONAL SKILLS

Skills and Digital Competence

- Programming: Python, C++, MATLAB , Javascript(NODEJS,Vuejs Framework)
- Databases: MongoDB, MySQL
- Robotic Frameworks: ROS, Gazebo, PDDL, Behavioral Trees
- Motion & Trajectory Planning: RRT, RRT*,A*, trajectory optimization
- Robot Localization ,Mapping and Sensors : SLAM, sensor integration (LiDAR, IMUs, GPS)
- Robot Perception and Computer Vision : OpenCV, PCL, PyTorch, object detection, sensor data processing
- Control Systems: Control loops, feedback mechanism

ADDITIONAL INFORMATION

Motion Planning:

1. Frontier-based exploration with RRT* for path planning, incorporating Dubins path to accommodate the dynamics of the robot in Turtlebot3 real time and simulation
2. Developed pick-and-place system for predefined objects places using behavioural trees for task planning.
3. Implemented A* algorithm in visibility graph and grid map for solving mazes and finding optimal paths

Projects

Computer Vision and Machine Learning:

1. Event Based Feature Tracking Using ICP
2. Implemented visual odometry with stereo camera utilizing SIFT feature matching
3. Implemented feature matching, calculating their homography for different models and applying RANSAC to improve the feature matching by rejecting the outliers
4. Fiducial Marker Based Augmented reality using OpenCV: including generating ArUco markers, creating boards, detecting markers, calibrating cameras, performing pose estimation, and drawing cubes.
5. Image Classification using CNN.

Probabilistic Robotics and Localization

1. Pose Graph Based SLAM using ICP for scan Matching
2. Feature Based SLAM (Landmarks as Feature)
3. Implementation of map-based Extended Kalman Filter (EKF) localization with three degrees of freedom input displacement and constant velocity model
4. Localization using Particle Filter for a Differential Drive Mobile robot, using data from wheel encoders and measurements from a known two-dimensional Cartesian map

Robot Manipulation and Intervention

1. Detect Object and Pick and Place Using Task Priority Algorithm Configuration , Position , Joint Limit and Inequality Task)

Honours and awards

- Award in Huawei ICT Competition 2018-2019 Global Final for Outstanding Performance
- Winning Excellent Students in Huawei ICT Competition Northern Africa 2018-2019

Seminar

- Award in Huawei ICT Competition 2018-2019 Global Final for Outstanding Performance
- Seminar Unveils Insights into Explainable Artificial Intelligence (XAI)
- Task Planning Using PDDI
- Sonar-Based Mapping and Localization by Dr. Aggelos Mallios
- Applications of Industrial Computer Vision at OPSIS by Dr. Marc Masias
- Applications of Perception in Industrial Mobile Robotic Dr. Enrique Fernandez