Buffalo, NY
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Christo Aluckal

Software Developer / Researcher

LinkedIn
Website
GitHub

Education

Master of Science, Computer and Information Science, University at Buffalo, GPA: 4.0 **Aug 2022 - Present**
Relevant Courses: Machine Learning, Reinforcement Learning, Robotics Algorithms, Computer Vision & Image Processing

Bachelor of Engineering, Computer Engineering, Mumbai University, GPA: 8.44/10.00 **Aug 2016 - Oct 2021**
Relevant Courses: Machine Learning, Digital Signal & Image Processing

Skills

Programming: C, C++, Python, MySQL, PostgreSQL
Frameworks: Numpy, Pandas, Matplotlib, OpenCV, PyTorch, Keras, Tensorflow, ROS 1/2, Optuna
Web Development: HTML, CSS, Javascript, Bootstrap, Flask, Django
Technology: Git, LaTeX, CAD
Software: Adobe Photoshop, GIMP, Adobe Premier, KDENLive, Blender, Metashape

Experience

DRONESLab (Researcher) **Oct 2022- Present**
University at Buffalo Buffalo, NY

- Member of a research group focused on developing autonomous race cars for the F1tenth Grand Prix
- Developed a Model Predictive Controller in **Python** using CasADi and ROS to accurately simulate Autonomous Vehicle control in Gazebo
- Created accurate simulation environments in the Gazebo simulator for developing and testing racing methodologies
- Implemented a Reinforcement Learning based trajectory tracking pipeline in **Python** using PyTorch and trained an agent to accurately track the trajectory
- Assisted in comparative studies of various Point Clouds and generated data sets for high resolution 3D Mapping using simulated LIDAR
- Conducted Autonomous Vehicle tests in a motion capture environment
- Created Programming Assignments and In-class activities for the Spring 2023 graduate Robotics Algorithms class at University at Buffalo

Software Developer (Intern / Part-Time) **May 2020 — Jul 2022**
InfiCorridor Solutions Pvt. Ltd. Mumbai, India

- Developed PixTrigger, an open souce framework for capturing and geotagging images interfaceable with more than 100 cameras in **Python** and **C/C++**
- Developed the No Permission No Take-off system in **C/C++** which verifies digital signatures allowing only authorized UAV missions to take place
- Experienced in auditing data, developing data, performing data validation, data verification and improve the efficiency for GIS applications
- Planned and executed multiple autonomous UAV missions to generate images and maps for Digital Elevation/Terrain Models
- Taught undergraduate students about fundamentals of UAV systems through multiple webinars

Projects

YOLOv5 based AR system
Technology: C++, OpenGL, Intel Realsense, OpenCV YOLOv5 DNN

- Developed a C++ pipeline that detects objects using YOLOv5 and localizes them using Intel depth/tracking cameras to overlay a generic 3D model using OpenGL

Building segmentation from Aerial Images
Technology: Python, GIS, Image Processing

- Built a pure Image processing and segmentation pipeline that allows users to selects buildings in an Orthographic image and obtain GIS relevant information such as elevation, shape, area using an associated Digital Elevation Model for further processing

Bachelor's Project: 3D Reconstruction of Environment using RGBD Imaging
Technology: Python, Depth Imaging, 3D, Solidworks

- Developed a system that easily converts a stream of RGBD Images into a Point Cloud and subsequently into a 3D Model within 8% error using simple 3D reconstruction methods

Tree Detection and Localization
Technology: Python, GIS, Tensorflow, Image Processing

- Implemented a proposed system that can detect trees, localize and extract their elevations from an Orthomosaic Image and an associated Digital Elevation Model

Publications

- *Generative-Network Based Multimedia Super-Resolution for Uav Remote Sensing*
  Yash Turkar; **Christo Aluckal**; Shaunak De; Varsha Turkar; Yogesh Agarwadkar
  IGARSS 2022 - 2022 IEEE International Geoscience and Remote Sensing Symposium, Kuala Lumpur, Malaysia, 2022
- *Dynamic real-time indoor environment mapping for Unmanned Autonomous Vehicle navigation*
  Christo Aluckal; B.K. Mohan; Yash Turkar; Yogesh Agarwadkar; Yashom Dighe; Sunil Surve; Sumedh Deshpande; Brijmohan Daga
  2019 International Conference on Advances in Computing, Communication and Control (ICAC3), Mumbai, India, 2019
- *Conceptualization of UAV Based Waypoint Generation for Precision Horticulture*
  Y. Turkar; **C. Aluckal**; Y. Dighe; S. Deshpande; Y. Agarwadkar 2020 IEEE India Geoscience and Remote Sensing Symposium (InGARSS)