WALEED AHMED

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SKILLS

C++ | C# | Python | JavaScript | HTML/CSS | Java | MATLAB

OpenCV | ROS | .NET | Git | Bash | Linux | Arduino | VHDL

EXPERIENCE

Video Software Developer

Synaptive Medical

Sep 2018 – Dec 2018 | Toronto, ON

- Reverse engineered third party camera color settings to improve visibility of biological tissue during surgical procedures
- Used **C#** for design and integration of image processing algorithms with existing software architecture in a Windows environment
- Post-processed image data in **Python** using data libraries such as **Pandas**, **Numpy**, and **Matplotlib** to analyze colour manipulation
- Used **OpenCV** in **C++** to model and apply colour transformations
- Created a Windows desktop application using the **.NET** framework to serve as a front-end interface for a serial communication protocol that allowed reading/writing of camera settings
- Created a web interface using **JavaScript**, **HTML**, and **CSS** for convenient and intuitive usage of a colour manipulation algorithm

Industrial Imaging Software Developer

P&P Optica

Jan 2018 – Apr 2018 | Waterloo, ON

- Developed software for industrial imaging applications on **Linux** machines with **Git** version control in an **Agile** environment
- Implemented image correction algorithms and post-processing for industrial cameras in **Python** using **Numpy**, **OpenCV**, and **Matplotlib**
- Refactored data handling modules for efficient file input/output and wrote unit tests for them in **Python** using **Pytest**
- Refactored camera control modules in **C/C++** that use the **Camera Link** serial protocol to interface with the camera for control purposes
- Documented software design decisions and a troubleshooting guide to efficiently debug issues pertaining to image acquisition

ACTIVITIES

Software Team Lead

UW Robotics

Apr 2018 – Present

- Leading software planning for a mobile racing robot set to compete in the **International Autonomous Robot Racing Competition**
- Developed software architecture using a **Linux** based framework; **ROS** (Robot Operating System), for efficient package management and communication between **machine vision** modules in **C++**
- Used **CUDA**, NVIDEA's parallel computing platform for GPU optimization of **OpenCV** code in **C++** for lane and object detection

PROJECTS

Arduino Jukebox

github.com/w29ahmed/Arduino-JukeBox

- Programmed in **C++** to use analog input from a variable resistor to cycle through a list of songs displayed on a 16x2 LCD screen
- Songs are hard coded frequency patterns digitally sent to a piezoelectric speaker

Toronto Raptors Image Classifier

github.com/w29ahmed/toronto-raptors-classifier

- Utilized transfer learning on Google's Inception v3 image classifier to identify players on the Toronto Raptors using **TensorFlow**, an open source **machine learning** framework in **Python**

Arduino Voltmeter

github.com/w29ahmed/Arduino-Voltmeter

- Programmed in **C++** to utilize a voltage divider circuit in order to read voltages up to 500 V (±1.4% error) and display it on a 16x2 LCD screen

Android Notes App

github.com/w29ahmed/Notes_App

- Simple but efficient note taking app for Android API levels 15 and above constructed using **Java**, **XML**, and a **SQLite Database**

EDUCATION

B.ASc Computer Engineering

University of Waterloo

2017-2022

Online Coursework

- Stanford University: Machine Learning with **MATLAB** by Andrew Ng
- Machine Learning A-Z: Hands-On **Python** & R In Data Science

INTERESTS

Machine Vision | Image Processing | Machine Learning | Gym | Reading | Basketball | Toronto Raptors