TengKang Khaw

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EDUCATION

UNIVERSITI SAINS MALAYSIA
BEng in Mechatronic Engineering
Grad. Aug 2020 | CGPA: 3.97

SMJK YU HUA, KAJANG
Sijil Tinggi Pelajaran Malaysia
Grad. Nov 2015 | CGPA: 3.83

SMK PERIMBUN, CHERAS
Sijil Pelajaran Malaysia
Grad. Nov 2013 | 6A+, 3A, 2A-, 1B+

LINKS

Github:// **TK-Khaw**
LinkedIn:// **TengKang Khaw**

SKILLS

HARDWARE
Arduino • PLC *OMRON CJ2M-CPU31*
myRIO • FPGA • Raspberry Pi
Kinova Robotic Arm

CAD
Solidworks • OpenSCAD
Orcad Capture, Pspice, Layout
LTSpice • Multisim
LabVIEW *CLAD 2018*

PROGRAMMING
C++ • Python • Bash and UNIX tools
Makefile • C#
Windows API • MFC • x86 Assembly
Django/Flask • JavaScript • SQL dialect
OpenCV • ROS • Android

DATABASES
Redis • PostgreSQL • MongoDB
InfluxDB • ElasticSearch

PROTOCOLS
RADIUS • SNMP • XMPP
MQTT • ProtoBuf • Netflow/IPFIX

SYSTEMS
Linux *RHEL and Debian* • Kubernetes
Docker • Google Cloud Platform
App Scripts, App Engine, Compute Engine, PubSub

EXPERIENCES

ATTRELOGIX NETWORKS SDN BHD | Software Engineer
Aug 2020 – Present | Kuala Lumpur, MY

- Worked on AAA backend development and optimizing backbone for multi modules integration to realize turn-key solution.
- Redesigned the main code structure to improve code readability and support future-proof and scalable development of the code base.
- Designed and implemented a major framework which is crucial for edge data ingestion and processing.
- Designed, developed and deployed highly available (HA) customized AAA solution equipped with system monitoring solution for a client with a projected subscribers count of 100,000 upwards.
- Worked on implementation of proprietary standard for integration of network functions.

VITROX CORPORATION BHD | R&D Industrial Trainee
Jun 2019 – Sep 2019 | Batu Kawan, MY

- Worked in Machine Vision System Business Unit.
- Assisted in improvement and development of backbone technologies in software of Vision Inspection Systems.
- Laid software and algorithmic foundation for development of new sub-system in New Product Introduction project.

ATTRELOGIX NETWORKS SDN BHD | Intern
Jun 2018 – Sep 2018 | Kuala Lumpur, MY

- Assigned to deal with development of Big Data Infrastructure deployment solution with the use of open- source tools such as Apache Hadoop, Spark as well as Hortonworks Data Platform.

ACHIEVEMENTS AND INVOLVEMENTS

2020	University	USM Chancellor's Gold Medal Award for the best final year student in all fields
2020	University	USM Gold Medal Award for the best final year student in BEng(Hons.)
2020	University	USM Gold Medal Award for the best final year student in Mechatronic Engineering
2019	Top 100	IEEEXtreme 13.0
2018	University	Vice Chairman of USM IEEE Student Branch
2016	National	Yayasan Telekom Malaysia Recipient

OPEN SOURCE CONTRIBUTIONS

- PostgreSQL HA packaged by Bitnami
- The Bitnami Library for Kubernetes

LANGUAGE

English • Malay • Mandarin

NOTABLE PROJECTS

IMPLEMENTATION OF COOPERATIVE CONTROL ON 7-DOF ROBOT ARM FOR ANTHROPOMORPHIC MANEUVER

Nov 2021 - Ongoing

- An inter-university collaborative research project involving researchers from Universiti Sains Malaysia and University of Manchester.
- Involved as research assistant tasked with the job of translating control laws in mathematical formulation into actual code.
- Cooperative anthropomorphic maneuver is developed with the principle of multi-agent based control and null-space control.

DISTBUTED COOPERATIVE CONTROL OF MULTI-ROBOT ARMS SYSTEM FOR CHOREOGRAPHED MOTION Sep 2019 - Jul 2020

- Developed as Final Year Project.
- System consisted of 3 independent Raspberry Pi connected to the same subnet controlling individual robot arm in a Gazebo simulation running on computer using hardware-in-a-loop concept. The entire system is built by leveraging ROS as robotic middleware. Synchronization of motions between robot arms are achieved through implementation of modified first-order consensus dynamic model.

AUTOMATED NURSERY IRRIGATION SYSTEM WITH IOT MONITORING SYSTEM Sep 2019 - Dec 2019

- An irrigation system is developed by exploiting the relationship between pressure and radial water distribution profile to maximize efficacy of conventional water sprinkler. The project is developed as capstone project.
- Pressure inside irrigation pipes are regulated using PID algorithm. The telemetry reporting and control of the system is made scalable by development of a communication backbone based on Google Cloud Platform. Sensors and valve control exists as individual nodes connected wirelessly to manifest the actual system itself.

2-DOF AGRICULTURE LAB-BASED GENERAL-PURPOSE ROBOTIC ARM Apr 2019 - May 2019

- An articulated robot with 2 joints is built as academic project with intention for precision operation in lab-based farm. To achieve generality the end-effector is modular and can be designed according to user needs.
- Robot joints is controlled by a microcontroller, which do trajectory planning online. The microcontroller maintains serial communication through specially designed protocol for instruction parsing with computer that hosts GUI control panel for which the user can send desired path as command to the robot.

WALKING ROBOT Sep 2018 - Dec 2018

- A 1-DOF robot with gaiting mechanism provided by Klann Linkage is developed to fulfill academic requirement.
- DC motor with hall encoder speed controlled using PID algorithm deployed on Arduino Uno is used to power the movement of the walking robot through a belt-and-pulley transmission.

IEEE USM SB REGISTRATION MANAGEMENT SYSTEM Sep 2018

- A web application front-end that uses Google Sheet as its backend.
- Provide ease of data manipulation for authorized personnel whilst a coded front-end to restrict user interaction to the database in only intended manner.
- Ease member registrations process and complicated manual process by automating task with Google App Script. Designed as such it is scalable to use as IEEE USM SB main registration method in the future.

SMART CCTV SYSTEM Aug 2018 - Sep 2018

- A software solution that is easily scalable with existing CCTVs infrastructure implemented throughout the factories.
- Used transferred learning to train a Convolutional Neural Network that could detect presences of ESD object through video feed. A factory wide alert system as well as a Human Resources Management Dashboard is developed to present detection and finding of the detection system.
- Used Long Polling method to allow real-time update on dashboard as well as alert system. Server resides in cloud enables horizontal scalability as well as cost reduction. REST API written in the form of PHP as well as a Python API for the integration of the detection system is also developed.

GEAR MANUFACTURING QUALITY CONTROL SYSTEM May 2018

- Academic project to fulfill requirement for Mechatronic Design. Used PLC to interact with pneumatic actuator, DC motor, and proximity sensors to build a gear manufacturing quality control system that resemble optical encoder in its principle of operation.
- Intended to reduce costs of gear manufacturing industry through a centralized quality control station, that is capable to converge all products from all models and redistribute accordingly.

DOOR ACCESS CONTROL SYSTEM May 2018

- Academic project to fulfill requirement for Microprocessor I. Used 8051 microcontroller with peripherals such as 8255 for building an electronics door access control and lecturer presence detection.
- Used method such as polling, external interrupt, and timer interrupt to orchestrate the entire system. Notably timer interrupt is used to generate servo motor control signal and external interrupt to detect motion with PIR sensor.

PARKING SPACE CONTROL SYSTEM Jan 2018

- A system that uses automated license plate recognition to detect car plate of parking space user and stored in databases for fee payment regulation and abolishes the use of paper ticketing system uses in conventional parking space. The system also registers empty spaces to inform user through an android client designed for this system.
- Program is developed to register incoming car into database. The program detects the license plate and generate a QR code for the user to scan with his android client as ‘e-ticket’. The program also detects outgoing car and make sure that they have paid their fee before exiting. The program is developed in C++ with the help of third-party libraries.
- The accumulated fee of each car and payment is registered by an updater program in a computer. GUI interface is implemented to display the database to operator and the program will update the fee in periodic interval. The program is developed in C#.
- An Android client to allow user to pay their parking fee as well as displaying empty lot is also developed in Java. Which is isolated from the database for security through a PHP implemented REST API.

WIND TUNNEL Dec 2017

- Academic Project that requires the use of Altera DE2-115 FPGA development board to control stepper motor and DC motor. Analog circuitry and Digital logic is implemented to make this project feasible.
- Stepper Motor is used to direct the DC motor fan for the vector of wind inside the wind tunnel. Flaperon like structure is implemented inside the tunnel to create turbulent test condition for the researcher using the wind tunnel.
- Control of Stepper Motor and DC motor is implemented with FPGA. RAM is also used to display static information on the LCD on the development board. Darlington Transistor is also used as motor driving circuit.

USMKKJ MAKERTHON GRADING SYSTEM Nov 2017

- A website that requires login from judges to identify their identity, which then is presented to them the assessment form for each presenting group, where their response will be stored in database and are free to be retrieved by the admin instantly to produce the ranking of presenting groups.
- Involved knowledge in HTML, CSS, JavaScript, PHP and SQL.