Foo Ren Xiang (Singaporean)
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EDUCATION

Nanyang Technological University (NTU) Aug 2015 – May 2020

Bachelor of Engineering (Electrical and Electronic Engineering)

- Specialization: Info-communications Engineering (Computer Engineering)
  - Relevant Subjects: 1) Intelligent System Design/Computer Vision (Machine Learning) 2) Computational Intelligence (Fuzzy Logic/Genetic Algorithm/Neural Networks) 3) Web Application Design 4) Data Structures & Algorithms

WORK EXPERIENCE/INTERNSHIP SUMMARY

***Undergraduate Research Assistant*, ST-NTU Corporate Laboratory** May 2017 – May 2020

Design and code control and telemetry software for simulated/physical robots *(Coordinator Software Modules)*

- Capture and analyse user requirements
- Propose and coded software implementation
- Sought user feedback for improvements in future iterations
- *Developed UAV* and *UGV* robots to be controlled by mission planner

Project 1: ***Coordination Program between ROS-based Mission Planner and Simulated Robots***
(Ubuntu Linux , C++, LUA, Bash Scripting, ROS, VREP, Git)
Project 2: ***Coordination Program between ROS-based Mission Planner and Physical Robots***
(Ubuntu Linux, Python, C++, Bash Scripting, Git, UWB positioning, ArduPilot, Mavlink)

***Bank Executive*, DBS Bank Ltd** Dec 2014 – Jan 2016 (1 year 1 month)

- Managed day to day business operational requirements of DBS' mobile applications (**DBS Lifestyle, DBS FasTrack**)
- Captured and documented Business Requirements for mobile applications' functionalities
- Monitored software development cycle and user deployment status
- Performed User Acceptance Testing and Bug Tracking/Documentation
- Used **Google Analytics** to track anonymous user statistics and gather app insights
- Design optimized marketing campaigns to drive App usage using gained insights
- Performed market and competitor analysis to identify future development and business threats

Project 1: **DBS Lifestyle App** Project 2: ***DBS FasTrack (Old Tea Hut Mobile Application)***

ACADEMIC PROJECTS/RESEARCH EXPERIENCE

NTU Final Year Project: ***Optimization of High Performance UAV (High Speed Drones)*** *(Ongoing)*

- Identified performance limitations of high speed drones and Machine Learning solution
- Designed high speed drone to acquire **time-series flight data** for analysis and **machine learning optimization**
- Develop *data pre-processor application & database* for real-time & historical flight data (q/kdb+)
- Develop Machine Learning regression modules with kdb+ integration to model UAV flight characteristics EmbedPy, Python (Pandas, Scikit-Learn, Keras/Tensorflow), MySQL, q IPC, ODBC, Matlab (Regression Learner)
- Predict optimal control input for UAV in real-time using trained Machine Learning models
- Visualize and analyse live-streaming/historical flight data using Tableau and Spotfire Analyst dashboards
- Implement custom q Ticker Plant to distribute computationally intensive and low-latency modules across different machines (ML training, Real-time Prediction and Real-time pre-processing of live telemetry)
- Deploy software modules to cloud at http://renxiang.cloud/OHR400Dashboard
- **Published and presented paper abstract** "*Dynamic Throttle Optimisation Of High Performance UAVs Using Machine Learning Techniques"* at **SocPros '19 Soft Computing Conference** in Liverpool, UK (Sept, 2019)
- **Github: https://github.com/foorenxiang/OHR400Dashboard**

NTU Intelligent System Design Module: **Face Recognition Using StarGan/PCA/KNN/OpenCV (Ongoing)**

- Develop face identification application using *Python* and *OpenCV*
- Wrote data mining Python scripts to compile photos for training data from publicly accessible websites
- Expand dataset by using StarGan to generate facial expressions from mined photos (synthesized images)
- Developed custom **Principal Component Analysis Python (PCA)** module (replaces sklearn PCA module)
- Apply K-Nearest-Neighbour technique to identify faces from webcam stream

NTU Undergraduate Research Opportunities Programme (UROP) : **Cloud Backend for Data Sourcing**

- Designed and implemented *REST API Data Structure* to store and send data from IoT sensor arrays
- Configured *MEAN Stack* on *Cloud-Hosted Ubuntu Linux Server* to deploy **REST API** and MongoDB database
- Studied **Hadoop** HDFS and MapReduce theories

NTU Design and Innovation Project: ***Planning and Coordination of UAVionics Workflow*** (**Team Leader** of 7 Members)

- Recruited and managed *6 Teaching Assistants*
- Taught *80* NTU Engineering undergraduates to build and program flight and land-based *drone systems*
- Researched and designed robotic kits used for teaching
- Planned and executed *two assessment events* with Teaching Assistant Team

SKILLS

- **Languages:** Fluent in English, Chinese (Mandarin)
- **Agile Software Development, UML**
- **Programming Languages:**

Python	Q/KDB	C++	MySQL	Unix/Linux BASH Scripting
Java	JavaScript	PHP	CSS 3	HTML 5
MongoDB	Express.JS	Node.JS	LUA Scripting	Robot Operating System (ROS)

- **Software Applications:**

Microsoft Office (Word, PowerPoint, Excel, Outlook)	Git Version Control
Ubuntu Linux, macOS, Windows	Ubuntu Web Server (DigitalOcean/AWS)
BASH Shell/Windows Command Line	Docker
Hadoop	KX Developer (Dashboard)

LEADERSHIP/CO-CURRICULAR ACTIVITIES

NTU UAVionics, *Vice-President* (May 2019 - May 2020), ***Secretary*** (Jul 2017 - May 2019)

- Conducted 3 *UAV Design Workshops* for NTU Engineering undergraduates
- Involved in planning and executing **national level** robotics competition "RippleUX" for primary to tertiary educational level students

Garage@EEE, Student Chairman (Jan 2016 – Aug 2016), **Student Vice-Chairman** (Aug 2015 – Dec 2015)

- Recruited and led inaugural Garage@EEE Student Ambassador committee
- Planned and directed preparation of 3 engineering workshops for NTU Engineering undergraduates (
- Explored potential collaboration across NTU faculties to promote *Maker Culture* in NTU EEE

Old Holland Road 400, *Founder and Team Leader* (Feb 2019 – Ongoing)

- Recruited and leading team of 3 to attempt ***Guinness World Record*** *(Fastest ground speed by a battery-powered remote-controlled (RC) quadcopter)*
- Directing technical development and flight operations
- Lead Developer (Aerodynamics, Mechanical, Launch Control)