

List of FYP title for academic session 2017/2018 - Mechatronic -Final

No	FYP Title	Synopsis	Requirement	Student Name	Supervisor
1	Extraction of Significant Chromosome Features to Detect Its Abnormality	This project involves: (i) Development of image segmentation to classify chromosome images into two regions (i.e. foreground (chromosome) and background). (ii) Development of image processing technique to separate overlapping and touching chromosome. (iii) Development of features extraction technique to extract significant features of chromosome in order to classify between normal and abnormal chromosomes. This project involves: (i) Development of image segmentation to classify chromosome images into two regions (i.e. foreground (chromosome) and background). (ii) Development of image processing technique to separate overlapping and touching chromosome. (iii) Development of features extraction technique to extract significant features of chromosome in order to classify between normal and abnormal chromosomes.	Student with good skill in programming (Matlab or C++) and good knowledge in image processing	KOH YE SHENG	Prof Ir Dr Nor Ashidi Mat Isa
2	MODIFIED IMAGE ENHANCEMENT ALGORITHM FOR DORSAL HAND VEINS IMAGING	The project requires student to use MATLAB particularly the Image Processing Toolbox to implement simple modified algorithm for hand vein imaging based on available hand images captured under near infrared (IR) lighting using a camera. The design of a Graphical User Interface (GUI) may also be required to demonstrate the effectiveness of the modified algorithm. On the other hand, another MATLAB project on toolkit design for electrical capacitance tomography simulator can be an alternative.	MATLAB programming skill is compulsory.	GAN SIEW LING	AP DR. JUNITA MOHAMAD SALEH
3	Smart Garbage Management with IoT System	The project proposes a smart alert system (Garbage Collection System smart and cloud linked) for garbage management by giving an alert signal to the webserver for instant cleaning of dustbin with proper verification. This process is aided by the ultrasonic sensor which is interfaced with Arduino UNO/ Raspberry Pi to check the level of garbage filled in the dustbin and sends the alert to the web server once if garbage is filled. Apart from that, RFID (one of the example) is a computing technology that is used for verification process and in addition, it also enhances the smart garbage alert system by providing automatic identification of garbage filled in the dustbin and sends the status of clean-up to the server affirming that the work is done. Overall, new features and approaches of smart system will be developed.	-GREAT interest in software and hardware implementation works. -Good in programming (IoT software and programming languages) -Some ideas on IoT development platforms.	LEE SOON CHONG	Dr Mohamad Khairi Ishak
4	IoT Based Scheme for Performance Assessment in Internet of Robotic Things	Internet of Robotic Things (IoRT) is a new concept which provides an active sensorization and is considered as the new evolution of IoT. In this project, it will focus particularly several issues in IoT such as connectivity maintenance among multiple IoRT robots, and the collective coverage. A robotic arm will be used to investigate the issue. The proposed approaches will try to find a trade-off between collective coverage and communication quality.	-GREAT interest in software and hardware implementation works. -Good in programming (IoT software and programming languages) -Some ideas on IoT development platforms.	TAN JING HUNG	
5	Food sensing at near infrared radiation at discrete wavelength	Food products contain chemical constituents which are sensitive to specific wavelengths in the NIR range. Measuring these constituents is important for grading, sorting and quality control of food products. This project investigates the NIR technology for measuring the chemical compositions of some selected food products at discrete wavelength.	Instrumentation and measurement, Image and Signal processing, MATLAB	ABDUL RAUF BIN AB RAZAK	Prof. Dr. Mohd Zaid Abdullah
6	Deep Learning based Face Recognition	Using the latest machine learning algorithm, which is known as Deep Learning, the student is expected to develop a basic system to recognition an identity of interest (IoI) in video surveillance system.	EEM348 and programming skills (MATLAB or C++)	MOHAMAD HAZIM BIN SAIDI	
7	Tracking Moving Object using Deep Neural Network (DNN)	Tracking a moving object from a moving camera is a very challenging task. This project aims to study the potential of using artificial intelligence (AI) based on Deep Neural Network (DNN) and latest learning algorithms such as deep learning to solve the problem.	EEM348 and programming skills (MATLAB or C++)	Cheong Leong Kean	PM Dr. Shahrel Azmin Suandi
8	3D Open JPEG2000 with Integer KLT	The environment for this project is mainly Linux - Ubuntu. Student should be able to have Ubuntu installed along with Windows OS (dual-boot) prior to the project. The project is mainly on C or C++ language, using Geany and GCC compiler. 3D Open JPEG2000 is targeted to be implemented using Geany. The completed 3D Open JPEG2000 will then used to expand the existing Integer KLT algorithm for hyperspectral image compression.	Strong C/C++ knowledge with at least B (preferable A) scored grade. Generic computer knowledge such as Windows and Linux installation skills.	SHAHRUL AZMAM BIN MAMAT	Dr. Nor Rizuan Mat Noor
9	CCSDS Hyperspectral Image Compression using C/C++	The Consultative Committee for Space Data System has published a standard to cater multi-component and lossless image compression (e.g. hyperspectral image) for space applications. The objective of this project is to understand, analyse, and test the algorithm with the actual data. The algorithm is available and student who is interested needs to write the codes in C/C++ language on desktop platform using Microsoft Visual Studio 2010.	Strong C/C++ knowledge with at least B (preferable A) scored grade.	TAN LIT CHEZ	
10	Bio acoustic signal Identification based on Sparse Representation Classifier	In recent years, frog species identification is becoming an important topic as frogs play an important role from the ecological system. In ecological system, frogs play an important role as an indicator of environment stress because they are one of the top predators in aquatic food web. Following the above reasoning, an automatic frog species voice identification system is essential to assist biologist to detect environment stress. In this study, we focus on identifying frog species by using their acoustic signals perceived distantly. This is an important feature because the sound wave does not depend on the day light. Moreover, in general, most frog species actually are nocturnal, using frog sound to identify species is actually a more viable approach than vision-based methods. In this study, the sound features based on frequency domain characteristics will be classified using Sparse Representation Classifier (SRC). SRC is a very interesting topic to represent sound signal in term of mathematical representation for artificial intelligent system.	Python programming using Spear Toolbox.	WAN ZHI XUAN	AP Dr Dzati Athiar Ramli
11	Control and Simulation of Three-Wheel Ball Throwing Machine	The student is required to design an expert system for projecting different type of ball trajectories such as in-swing, out-swing, top-spin and knuckle-ball.	Hardware: microcontroller	TEO SHUN YANG	
12	Design and Analysis of CMOS Image Sensor	The student is required to design the CMOS image sensor, analyse the sensor and design the control circuit for the sensor.	Software: IC design software	NURANISAH BINTI HALIM	Dr Anwar Hasni
13	DISTRIBUTED SYNCHRONISATION CONTROL OF 5 ARTICULATED ROBOTS FOR INDUSTRY 4.0 APPLICATION	The project will embark on the design of a distributed synchronisation control of 5 articulated robot arms. All the five articulated robot arms will be connected over a network by which control signals of the robot arms will be shared across and the information about each robot is exchanged among them. The shared control signals concept bring about the spirit of Industry 4.0 by which series of robots are interconnected and co-operate with each other to work for a common goal. The concept of Co-bots or Collaborative Robots will be introduced to the students whereby the students may have the opportunity to visit an industrial plant to better understand the concept of Co-bots. The students are able to appreciate the existence of a Co-bot as a complementing partner worker which work and needing each other. It is the opposite of the conventional paradigm whereby once the robots are thought to replace human.	ROBOTICS, DIGITAL CONTROL SYSTEM, MECHATRONICS	MOHAMAD NORHAFFI BIN MD HANIF	DR. MUHAMMAD NASIRUDDIN MAHYUDDIN
14	ADAPTIVE OBSERVER FOR FAULT DIAGNOSTIC OF A MECHATRONICS SYSTEM	The project will involve the design of an adaptive observer which estimates parameters of a mechatronics system to predict failure or faults in a mechatronics system.	CONTROL SYSTEM, CONTROL SYSTEM DESIGN, MECHATRONICS	Muhammad Amirul Asyraf Bin Saidin	

15	Obstacle detection and avoidance system			YEW CHANG CHERN	AP Dr. Harsa Amylia Mat Sakim
16	Pedal power energy harvesting	Pedal power is the transfer of energy from a human source through the use of a foot pedal and crank system. Bicycles mainly employ this technique to transfer power. In some developing countries are using pedal powered tools. Although this is a relatively slow method, it is clean energy. Pedal technology is nearly perfect with 97% efficiency. Using your own power helps you understand the amount of energy you use, reduce your ecological footprint and help you burn some calories. There is nearly one bicycle in every home. We can use pedal power to charge phones, process food, and pump water.		SYEIKH MUHAMMAD HAZIQ BIN SAH AZMI	
17	Air Pollution Detector	The goal of this project is therefore to develop a more complete understanding of urban atmospheric chemistry in megacities using low-cost atmospheric measurement devices, gathering data that can be leveraged by governments and researchers to mitigate air pollution. The aim of this project is develop a prototype which includes inexpensive sensors that can be deployed in dense networks to monitor criteria pollutants and to monitor data in real-time.		Ng Wei Jian	Dr. Zuraini Dahari
18	Swarming to optimise PID controller	Swarming to optimise PID controller	NIL	NIK MUHAMMAD AIMAN BIN NIK MOHAMED HAZLI	Dr. Wan Amir Fuad bin Wajidi Othman
19	2D Swarn Behaviour Modelling	2D Swarn Behaviour Modelling	NIL	NG HONG SHEN	
20	Design Speed Control for Boat	Controller design is going to be used for controlling speed of the propeller during low and high speed manoeuvre. The speed of the boat will be determined according the angle of attack of boat. The main focus of this project is to control the boat stability while carrying 200 kg load.	Control system, Arduino based on Gyro, Fiberglass, Matlab	AMIRUDDIN BIN MUSTAFA KAMAL ISKANDAR	Dr. Wan Rahiman
21	Stability of Hydrofoil Boat	Controller design is going to be used to determine manoeuvrability of the boat. The attached hydrofoil is the key player in controlling the boat stability. The main focus of this project is to control the boat stability while carrying 200 kg load.	Control system, Arduino based on Gyro, Fiberglass, Matlab	MOHAMMAD ARIFF SYAMIL BIN IDRUS	