The Institution of Engineers, Malaysia

RBTX CHALLENGE · PETROSAINS

# 1 DAY ICTSIG JUNIOR DIGITAL CLASS RBTX COMPETITION WORKSHOP

DATE: 29TH JULY 2023 (SATURDAY)
VENUE: IEMMAKER SPACE ROOM, GROUND FLOOR, WISMA IEM, PETALING JAYA, SELANGOR
SPEAKER: IR. AMIR HUSSEIN BIN JAAFAR

EACH STUDENTS IS REQUIRED TO BRING OWN LAPTOP
REQUIRED ELECTRONIC KIT WILL BE PREPARED (ON LOAN) FOR EACH STUDENTS

SYNOPSIS

To provide the necessary interest and skill in robotics and embedded coding, we often look at how students and robotics enthusiast can gather to learn, discover and compete using their robot creation is an open source electronics and software platform like Petrosains RBTX Challenge 2023 (https://petrosains.com.my/rbtx-challenge-2023/) In Petrosains RBTX Challenge 2023 Robo Trace Open, the challenge is to construct a robot that can move on a given line with left, right and cross junction and pass through all designated checkpoints on a predefined track. This is an autonomous racer device, a pathfinder robot that can move smartly based on a black line or white line on the path with junctions. In this course, coaches will explain about devices and their features that are built using electronic hardware and software coding that is suitable to compete in that said robotic challenge. Coaches will introduce to the participants specific purpose pathfinder robot, an Arduino-compatible open source electronic hardware developed suitable as a STEM education tools and for competing in defined challenges. Next, participants will be introduced to software coding, coding control structure, algorithm and flow chart. Then, be introduced to Mixly and Blockly, a software coding language created suitable as a STEM education tools. Participant will learn the basics of Mixly abd Blockly for enhance control logics. In addition participants will discuss and learn the pathfinder robot specific functionality and strategy for the pathfinder robot to complete its task most effectively. Finally, participants will start to configure, operate and test the pathfinder robot on a practice track. Participants will be guided to troubleshoot and overcome any problem that they faced during this period. Once participants are accustomed with the pathfinder robot functionality and strategy and, basics, advance and libraries, as build-up to the highlight of the course, participants will start to configure and prepare the pathfinder robot on a competition challenge track. Students will NO LONGER be guided but they will have to troubleshoot and overcome any problem that they faced during this period by themselves.
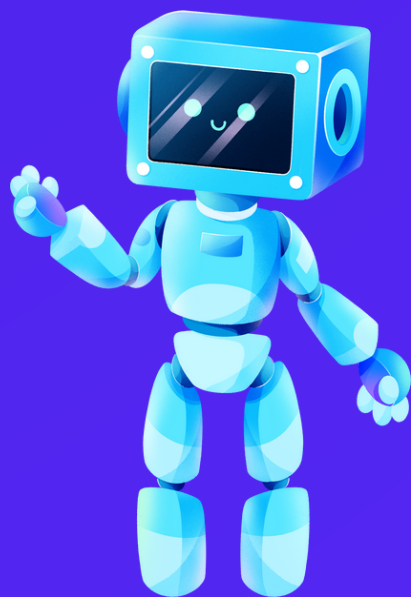
ABOUT THE SPEAKER

Ir. Amir Hussein Bin Jaafar graduated from University of Technology Petronas (UTP) with Bachelor Engineering (Electrical and Electronics) and from Universiti Teknologi Malaysia (UTM) with Master of Science (Real Time Software). He is registered as a Professional Engineer (Electronics) status with Board of Engineers Malaysia since 2007. He has more than 17 years of experience in electronics hardware and embedded software development projects, and development and testing of advance powertrain and electronic control system for automotive application, and development of IoT applications. With the industry experience, he has been curating and conducting specialized green technology training to TVET trainers and also curating and conducting STEM courses for school students since 2016. He is currently the Technical Director for Micro Concept Tech Sdn Bhd.

PROGRAM TENTATIVE

1 Introduction to STEM education and STEM in Me programme

Introduction to specific purpose robot: path finder robot
Introduction to basics of Blockly or Scratch coding block or C/C++ language
Brief usage explanation on Blockly or Scratch blocks libraries or C/C++ language for path finding robot: robot prepare
Brief usage explanation on Blockly or Scratch blocks libraries or C/C++ language for obstacle avoider robot: start robot template
Brief usage explanation on generic Blockly or Scratch programming blocks or C/C++ language: delay
Brief usage explanation on Blockly or Scratch blocks libraries or C/C++ language for path finding robot: while true stop
Introduction to LED output and respective output trinket coding

2 Explanation on path finding robot basic movement
Introduction to electric motor output trinket and respective output trinket coding: steer direction, stop
Introduction to electric motor output trinket and respective output trinket coding: tank turn
Configuration of path finder robot to pass through all possible type of off-line free movement

3 Detail explanation on Blockly or Scratch blocks libraries or C/C++ language for path finder robot: line tracer time and turn at centre
Configuration of path finder robot to pass through all possible type of line with straight, wavy, time based and u-turn

4 Detail explanation on Blockly or Scratch blocks libraries or C/C++ language for path finder robot: path finder tank
Configuration of path finder robot to pass through all possible type of line with left, right and cross junction

5 & 6 Configuration of path finder robot to pass through designated checkpoints for predefined practice challenge track
Course wrap up

Register at: www.iem.org.my

THIS EVENT IS FREE

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RBTX COMPETITION WORKSHOP
ORGANISED BY: INFORMATION AND COMMUNICATIONS TECHNOLOGY SPECIAL INTEREST GROUP, IEM
EMAIL US AT : shamalah@iem.org.my

NAME OF STUDENT			
MAILING ADDRESS			
EMAIL:		HAND PHONE:	
IEM PARENT MEMBER NAME:		IEM PARENT MEMBERSHIP NUMBER:	

DUE TO LIMITED NUMBER OF LAPTOPS IN THE IEM MAKER SPACE, EACH STUDENT IS REQUIRED TO BRING OWN LAPTOP. HOWEVER, DO CONTACT THE SECRETARIAT IF THERE ARE DIFFICULTIES

NAME OF STUDENT

MAILING ADDRESS