

Reference: AMG-AM-24-03

10 มกราคม 2567

เรียน

เรื่อง ขอประชาสัมพันธ์และเรียนเชิญร่วมการอบรม Feedback Control Workshop ด้วย Waijung 2 for ESP32
สิ่งที่ส่งมาด้วย

- 1) เอกสารประชาสัมพันธ์ [Internet of Things \(IoT\) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop \(RC-circuit controller project-based learning\)](#)
- 2) เอกสารประชาสัมพันธ์ [Internet of Things \(IoT\) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop \(Balancing robot controller project-based learning\)](#)

บริษัท เอ็มเมจิ้น จำกัด และ มหาวิทยาลัยมหิดล มีกำหนดจัดอบรม Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (RC-circuit controller project-based learning) ระหว่างวันที่ 29 กุมภาพันธ์ 2567 ถึง วันที่ 1 มีนาคม 2567 และ Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Balancing robot controller project-based learning) ระหว่างวันที่ 6 มีนาคม 2567 ถึง วันที่ 7 มีนาคม 2567 ณ อาคาร 3 (ตึกสี่แดง) ชั้น 3 ห้อง 6373 คณะวิศวกรรมศาสตร์ มหาวิทยาลัยมหิดล โดยไม่มีค่าใช้จ่าย การอบรมเป็นแบบ Project-Based Learning เพื่อแนะนำการพัฒนาาระบบควบคุมผ่านระบบเครือข่าย (Internet of Things) ด้วยเทคนิค Model-Based Design และ Waijung 2 for ESP32 และการสร้าง Embedded web application ด้วยเทคนิค Drag-and-Drop ด้วยซอฟต์แวร์ Aimagin Connect

บริษัทเห็นว่าการอบรมดังกล่าวน่าจะเป็นประโยชน์ต่อท่านและหน่วยงานของท่านจึงขอเรียนเชิญท่านเข้าร่วมการอบรมดังกล่าว เนื่องจากการอบรมจำกัดจำนวนไม่เกิน 10 ท่าน จึงขอให้ท่านที่สนใจกรุณาลงทะเบียนเพื่อสำรองที่นั่งก่อน ในแบบลงทะเบียนสำรองที่นั่งนี้ <https://forms.gle/4hq5poMFv9F3kuuF9>

จึงเรียนมาเพื่อโปรดพิจารณา

ขอแสดงความนับถือ



(กฤษฎา แสงเพชรส่อง)

กรรมการผู้จัดการ

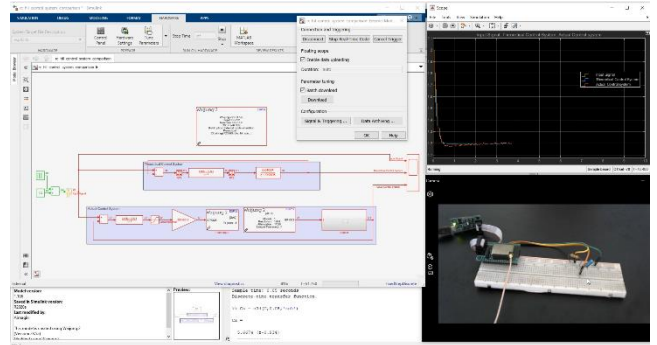
Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (RC-circuit controller project-based learning)

Mahidol University and Aimagin Co.,Ltd. is honored to invite you to join the Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Resistor Capacitor: RC-circuit controller project-based learning).

Target audiences: Lecturers and researchers in Automatic Control System, Model-Based Design (MBD), and Internet of Things (IoT).

Training objectives:

1. Understand the whole MDB workflow (System model simulation, Hardware in the Loop (HIL) test, Stand-alone application development), using a simple plant model.
2. Understand PID controller design methodology (Root Locus example), and practical issues in control system design such as control effort limitations and sensor calibration.
3. Understand how to implement a web application to remotely monitor and control a device using drag and drop tools (Aimagin Analytics and Aimagin Connect).



Schedule: 2 days (29 February 2024 and 1 March 2024).

Place: Building 3 (Red building) 3thFloor Room 6373 Faculty of Engineering, Mahidol University (Salaya).

Language: English (No translation will be provided).

Cost: Free

Number of on-site attendees: Maximum 10 people.

Online attendance: To be determined.

Lunch and break: Provided by the organizer.

Training materials: [RC circuit feedback controller with Waijung 2 for ESP32](#)

For attendees to prepare:

1. Attendees must bring their own notebooks to the workshop.
2. All software and hardware will be provided by the organizer. (The following software is required. MATLAB 2022b, Simulink, Matlab Coder, Simulink Coder, Embedded Coder, Stateflow, Control System toolbox, Waijung 2 for ESP32, Aimagin Connect). Instructions to prepare the software will be provided later.
3. If you are interested in joining, please register using [this form](#). Reservation is limited to 10 people and based on first come first served only. So, register as soon as possible to reserve your seat.

Schedule

Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Resistor Capacitor circuit project-based learning)

29 February 2024

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| 08:30 – 09:00 | Registration. |
| 09:00 – 09:15 | Welcome message |
| 09:15 – 10:00 | Introduction, software and hardware preparation. |
| 10:00 – 10:30 | Coffee break |
| 10:30 – 12:00 | Resistor Capacitor (RC) circuit model development and simulation. |
| 12:00 – 13:00 | Lunch break |
| 13:00 – 15:00 | Test and compare real RC circuit and simulation using Hardware-In-the-Loop (HIL) test. |
| 15:00 – 16:30 | Design an RC circuit PID controller using Control System Toolbox and Root Locus technique. |

1 March 2024

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| 09:00 – 10:00 | Implement the actual PID controller. |
| 10:00 – 10:30 | Coffee break |
| 10:30 – 12:00 | Analyze and tune control system performance using HIL test. |
| 12:00 – 13:00 | Lunch break |
| 13:00 – 16:30 | Implement web-based stand-alone controller using drag and drop tools. |

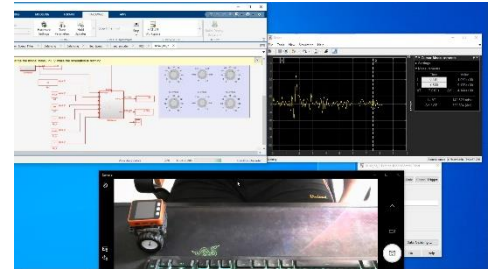
Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Balancing robot controller project-based learning)

Mahidol University and Aimagin Co.,Ltd. is honored to invite you to join the Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Balancing robot controller project-based learning).

Target audiences: Lecturers and researchers in Automatic Control System, Model-Based Design (MBD), and Internet of Things (IoT).

Training objectives:

1. Understand how to use MDB tools to design a complex control system.
2. Understand how to develop embedded firmware to read sensor (Inertia Measurement Unit - IMU) and to control motors.
3. Understand how to design a complex control algorithm and tune a PID controller.
4. Understand how to implement a web application to remotely control a device using drag and drop tools (Aimagin Analytics and Aimagin Connect).



Schedule: 2 days (6 March 2024 and 7 March 2024).

Place: Building 3 (Red building) 3thFloor Room 6373 Faculty of Engineering, Mahidol University (Salaya).

Language: English (No translation will be provided).

Cost: Free

Number of on-site attendees: Maximum 10 people.

Online attendance: To be determined.

Lunch and break: Provided by the organizer.

Training materials: [Balancing robot with Waijung 2 for ESP32](#)

For attendees to prepare:

1. Attendees must bring their own notebooks to the workshop.
2. All software and hardware will be provided by the organizer. (The following software is required. MATLAB 2022b, Simulink, Matlab Coder, Simulink Coder, Embedded Coder, Stateflow, Control System toolbox, Waijung 2 for ESP32, Aimagin Connect). Instructions to prepare the software will be provided later.
3. If you are interested in joining, please register using [this form](#). Reservation is limited to 10 people and based on first come first served only. So, register as soon as possible to reserve your seat.

Schedule

Internet of Things (IoT) Feedback Control with Model-Based Design and Waijung 2 for ESP32 Workshop (Resistor Capacitor circuit project-based learning)

6 March 2024

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| 08:30 – 09:00 | Registration. |
| 09:00 – 09:15 | Welcome message |
| 09:15 – 10:00 | Introduction, software and hardware preparation. |
| 10:00 – 10:30 | Coffee break |
| 10:30 – 12:00 | Develop a Simulink model to read IMU sensor, compute tilt angle, and perform wireless (Wifi) Hardware-in-the-Loop (HIL) test. |
| 12:00 – 13:00 | Lunch break |
| 13:00 – 15:00 | Develop a Simulink model to control motors, tune a PID controller using HIL test, so that the robot can remain upright. |
| 15:00 – 16:30 | Develop and simulate a control algorithm to control the robot's forward and turn movement. |

7 March 2024

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| 09:00 – 10:00 | Test control robot movement (forward, backward, left turn, and right turn) using HIL. |
| 10:00 – 10:30 | Coffee break |
| 10:30 – 12:00 | Create a web application to control the robot using drag and drop technique. |
| 12:00 – 13:00 | Lunch break |
| 13:00 – 16:30 | Create a stand-alone system that integrates the control algorithm and the web application. |