



# *Workshop on* Characterisation of Electrochemical Transducers for Biosensor Applications

30 & 31 March 2020

Science Lab 2, SEAMEO RECSAM  
Penang, Malaysia

*Organised by:*

Southeast Asian Ministers of Education Organization  
Regional Centre for Education in Science and Mathematics  
Jalan Sultan Azlan Shah, 11700 Gelugor, Penang, Malaysia

[www.recsam.edu.my](http://www.recsam.edu.my)

## Rationale

Biosensors are devices that detect and report the presence or quantity of a particular analyte. Among the biosensor components, a physicochemical transducer measures physical and chemical changes from analyte-recognition interactions where products, by-products, intermediates or physical changes are converted into a measurable signal. The character of the transducer determines the performance of a biosensor; hence, the characterisation of the transduction is crucial in the design of a biosensor. This workshop will demonstrate electrochemical characterisation of the transducer layer of a biosensor via cyclic voltammetry.

## Objectives

At the end of the workshop, the participants should be able to:

- Learn the fundamentals and perform practical scientific experiments using biosensor.
- Understand the role of embedded system in biosensor applications using Arduino microcontroller platform.
- Explore smart applications using Arduino for biosensor-based technology.

## Targeted Participants

Secondary science teachers, teacher-educators from teacher training institutes, colleges and universities, curriculum specialists / experts from the Ministry of Education, State Education Officers.

## Date and Venue

30 & 31 March 2020 (Monday & Tuesday)  
Science Lab 2, SEAMEO RECSAM, Penang, Malaysia

## Organiser

SEAMEO RECSAM, Penang, Malaysia

## Facilitator

### **Dr. Wan Wardatul Amani binti Wan Salim**

Assistant Professor  
Department of Biotechnology Engineering  
Faculty of Engineering  
International Islamic University of Malaysia  
Gombak, Kuala Lumpur, Malaysia

### **Mohd. Zuhaili Mohd. Rodzi**

Lead Specialist  
Robotics & Automation Department  
Integrasi Erat Sdn. Bhd.

### **Mohd Aizat Mohd Yazid**

Department of Mechatronics Engineering  
Faculty of Engineering  
International Islamic University of Malaysia  
Gombak, Kuala Lumpur, Malaysia

## Workshop Fee

- Type I : RM 380.00 per participant (without accommodation)
- Type II : RM 490.00 per participant (twin-sharing accommodation at RECSAM International House)
- Type III : RM 600.00 per participant (single occupancy at RECSAM International House)

The workshop fee covers the cost for workshop materials, workshop certificate and meals during the workshop for each participant. Proof of payment is needed to secure your seat in the workshop. Kindly be informed that this workshop is limited to 30 participants on first-come-first serve basis.

## Accommodation at RECSAM International House

For Type II and Type III participants boarded at RECSAM International House

Check-in: 29 March 2020 (Sunday) from 2.00 p.m. onwards

Check-out: 1 April 2020 (Wednesday) before 12.00 p.m.

## Food

Morning tea, lunch and afternoon tea will be provided by SEAMEO RECSAM during the workshop.

For participants registered under Type II and Type III, breakfast will be provided.

## For Enquiries

Ms. Tiana Mohamad: +604 6522 764 (tiana@recsam.edu.my)

Ms. Umami Kalsum binti Abd Aziz: +604 6522 761 (ummi@recsam.edu.my)

Mr. Dominador Dizon Mangao: +604 6522 760 (dominador\_mangao@recsam.edu.my)

Submission of registration should be done before or by **23 March 2020**. Kindly be informed that this workshop is **limited to 30 participants only**.

For registration, visit <https://forms.gle/eX6xSB3UcRQ1gRWd9>  
or scan the following QR code:



## Schedule of Activities

Day 1 (Monday, 30 March 2020)	
0800 - 0900	Registration
0900 - 0930	Opening Ceremony
0930 - 1030	Topic #1: Introduction to Electrochemistry
1030 - 1100	Group Photo & Tea Break
1100 - 1230	Topic #2: Introduction to Nanomaterials for Electrochemical Sensors
1230 - 1400	Lunch Break
1400 - 1630	Topic #3: Electrochemical Sensors Characterisation
1630	Tea Break and End of Day 1
Day 2 (Tuesday, 31 March 2020)	
0830 - 1030	Topic #4: Arduino Basic 1
1030 - 1050	Tea Break
1050 - 1230	Topic #5: Arduino Basic 2
1230 - 1400	Lunch Break
1400 - 1600	Topic #6: Arduino for Biosensor Applications and Future Technology
1600 - 1630	Closing Programme and Certificate Presentation
1630	Tea Break and Travel Home

*Note: This programme schedule may be subjected to changes without prior notice*

## Introducing the Facilitators



### **Dr. Wan Wardatul Amani binti Wan Salim**

Department of Biotechnology Engineering  
Faculty of Engineering  
International Islamic University of Malaysia  
Gombak, Kuala Lumpur, Malaysia

**Dr. AMANI** received her B.Sc. and M.Sc. in Electrical Engineering from University of Minnesota Twin Cities in 2001 and 2003 respectively, and her Ph.D. in Biomedical Engineering from Purdue University in 2009.

Prior to her position at the International Islamic University of Malaysia, where she is currently teaching, Dr. Amani was a Postdoctoral researcher at Purdue University, USA and was appointed as the Principal Investigator to a NASA Small Satellite project ([www.sporesat.org](http://www.sporesat.org)). Dr. Amani's research focuses on multidisciplinary approaches for the development of advanced sensor technologies with applications in agriculture, biology, environmental science, medicine and space biology. Dr. Amani has published numerous research articles in leading journals such as *Langmuir*, *Lab on a chip*, *Advanced Materials*, and *Nanotechnology*. She also received the *Thora W. Halstead Young Investigator's Award* in 2012 from the American Society for Gravitational and Space Research (ASGRS), and was recipient of the 2015 *National L'Oréal – UNESCO Fellowship for Women in Science*. Dr. Amani is also a public speaker and populariser of science, having spoken at TEDxKL, various government- and institutional-led initiatives in technology commercialisation and entrepreneurship.





### **Mohd. Zuhaili Mohd. Rodzi**

Lead Specialist

Robotics & Automation Department  
Integrasi Erat Sdn. Bhd.

Mohd. Zuhaili graduated from International Islamic University Malaysia with a degree in Mechatronics Engineering and Master in Management. He is currently pursuing his Ph.D. in Computer Science at Universiti Teknologi

Malaysia. His research domain of interest primarily focus on ontology, knowledge management and robotics system that contribute to the development of many research prototypes such as autonomous vehicles, educational nano-satellite (CANSAT) and industrial automation. Adaptive to the advancement in ICT that promotes crowdsourcing and 'Internet of Things' (IoT), his present work focuses on community based flood sensor and knowledge integration framework supported by ontological backbone. In the commercial domain, he worked with few companies to produce customise and locally made hardware and software products such as Autonomous Guided Vehicle (AGV) for logistic automation.



### **Mohd. Aizat Mohd Yazid**

Department of Mechatronics Engineering  
Faculty of Engineering  
International Islamic University of Malaysia  
Gombak, Kuala Lumpur, Malaysia

Mohd. Aizat graduated with a degree in Electronics-Computer and Information Engineering from International Islamic University Malaysia (IIUM). He was involved in building

Automated Guided Vehicles (AGV) at a local company for 4 years, starting with troubleshooting and later on with assembly and quality control as well. He's also a robotics club instructor, teaching electronics and programming at a primary school in Ampang for 6 years running. His interests in the current engineering technology involves robotics and automation, microcontrollers and the Internet of Things (IoT). He is currently doing his Masters in Mechatronics Engineering in IIUM, focusing on his project on developing an IoT flood sensor.



**PARTICIPATION FORM**  
**Workshop on Characterisation of**  
**Electrochemical Transducers for Biosensor**  
**Applications**  
**30 & 31 March 2020**



**PARTICIPANT'S INFORMATION**

Name:

☐ Prof.   ☐ Dr.   ☐ Mr.   ☐ Ms.   ☐ Mrs.   ☐ Mdm.   ☐ Other (please specify):

Institution:

Correspondence Address:

Office Phone:

Mobile Phone:

Email:

**SPECIAL REQUEST FOR MEALS**

☐ No special request   ☐ Vegetarian   ☐ Other (please specify):

**WORKSHOP FEE**

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**PAYMENT MODE**

- ☐ Payment via Local Order (Payable to SEAMEO RECSAM)
- ☐ Internet banking (Pay to: SEAMEO RECSAM, Account Number: 5571 5700 0647)
- ☐ Telegraphic Transfer or TT

Payable to: SEAMEO RECSAM, Account No. 557157000647

Account Type: Current Account, SWIFT Code: MBBEMYKL

Bank: Malayan Banking Berhad

Address: 345-H, Bangunan Kelab Gelugor, 11700 Gelugor, Penang, Malaysia

Please share your proof of payment with the staff listed under the For Enquiries field along with the name of the workshop participant(s).

Signature of Applicant: \_\_\_\_\_

Date: \_\_\_\_\_


Kindly be informed that this workshop is limited to 30 participants on first-come-first serve basis. Confirmation of attendance and submission of Participation Form should be done on or before **23 March 2020** to:

Director  
SEAMEO RECSAM  
Jalan Sultan Azlan Shah  
11700 Gelugor, Penang


by fax at 604-6522737 or email: [tiana@recsam.edu.my](mailto:tiana@recsam.edu.my) / [ummi@recsam.edu.my](mailto:ummi@recsam.edu.my)





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