



# Artificial Intelligence Short Course

## *Fuzzy Logic, Neural Networks and Particle Swarm Optimization (PSO)*

### Course Outline

#### Introduction to MATLAB

*Working with the MATLAB Integrated Development Environment (IDE)*

#### Method 1: Fuzzy Logic

*Fuzzy sets, Membership functions, Logical operations, Fuzzy inference systems (FIS) and Application examples*

#### Method 2: Neural Networks

*Neural Networks concepts, Transfer Functions, Neuron model and network architectures, Multiple Layers of Neurons, Graphical User Interface, Importing from the Command Line and Application examples*

#### Method 3: Particle Swarm Optimization (PSO)

*Theory, algorithms, and applications of optimization, Parameter selection, Convergence Multi-objective optimization.*

### Course Instructors:



**Saad Mekhilef** (M'01-SM'12) received the B.Eng. degree in electrical engineering from the University of Setif, Setif, Algeria, in 1995 and the M.Eng.Sci. and Ph.D. degrees from the University of Malaya, Kuala Lumpur, Malaysia, in 1998 and 2003, respectively. He is currently a professor and director of Power Electronics and Renewable Energy Research Laboratory, Department of Electrical Engineering; University of Malaya. He is the author and co-author of more than 200 publications in international journals and proceedings. He is actively involved in industrial consultancy, for major corporations in the power electronics projects. Part of his research interest includes application of artificial intelligence in control of power converters, renewable energy systems, and energy efficiency.



**Hanieh Borhanazad** (M'13) received her B.Eng. degree in Electrical Engineering from Islamic Azad University south Tehran branch, Iran in 2009 and the M.Eng. degree in Electrical/Electronic Manufacturing from University of Malaya, Malaysia in 2013. Her research interests include artificial intelligence and Hybrid renewable energy systems. She has been awarded a patent for implementation of a Painter Robot capable of intelligent recognition of segments through infrared rays. Part of her Master's thesis involved multi objectives Particle Swarm Optimization (PSO) to design a reliable and cost effective small-scale hybrid renewable energy system. Her new method on wind prediction by designing data fusion algorithm through several neural networks published in IEEE Transactions in 2014. She is currently a Research Assistant in the Power Electronics and Renewable Energy Research Laboratory, involving in application of fuzzy logic controllers.

### Date, Time and Venue

**Date:** 5/5/2014 - 21/5/2014.

**Time:** 5:00 - 7:00 pm.

**Venue:** Cube 2, Department of Electrical Engineering (Former Built Environment Faculty), University of Malaya.

### Registration Fees (RM)

	Non IEEE Member	IEEE Member
Introduction + 1 AI method	<b>240</b>	<b>200</b>
Introduction + 2 AI methods	<b>360</b>	<b>300</b>
Introduction + 3 AI methods	<b>480</b>	<b>400</b>

\* *Certificates will be given to the participants at the end of the course.*

### Course Schedule

<u>Session</u>	<u>Date</u>
Introduction	5/5/2014
Fuzzy Logic	6/5/2014; 7/5/2014; 8/5/2014
Neural Networks	12/5/2014; 13/5/2014; 14/5/2014
PSO Method	19/5/2014; 20/5/2014; 21/5/2014

### Registration fee can be made via direct bank transfer to:

**Bank Name :** Bank Islam  
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