



MEGAWATI

Home Country
Indonesia

Degree
MSc in Electrical
Engineering

Expertise
Electronics and
Electrical Engineering

Research Focus
Groundwater Flow and
Petrophysical
Analysis Using
Back-Propagation
Network

Host University
Technical University
of Denmark

Fellowship Awarded
2005

Megawati was born in Indonesia. She received her undergraduate degree in electrical engineering from the Bandung Institute of Technology (ITB) in 2002. Prior to that she studied computational intelligence and systems science at the Tokyo Institute of Technology in Japan, where she obtained a grade point average of 3.9.

In Tokyo she developed a new neural network called Self-Organized Network Inspired by Immune Algorithm (SONIA) and applied it to pattern recognition and clustering analysis. One of her papers based on this work earned an Excellent Presentation Award at the First International Conference on Soft Computing and Intelligent Systems in 2002 in Tsukuba, Japan.

Megawati began studying for her MSc in electrical engineering at the Technical University of Denmark in 2005, where her research into signal processing in the oil and gas industry focused on groundwater flow and petrophysical analysis using the back-propagation network method, a mathematical model of underground water flow used to identify the permeability coefficients of rock formations and to predict such aspects as seepage rates.

Signal processing techniques and algorithms can help determine the presence of oil and gas deposits in rock layers. As well, they can help in seismic data analysis, in perforating operations and, particularly, in intelligent wells where downhole sensors made from optical fiber provide information about such things as water content in the oil. This information enables workers to make choke valve and injection sleeve changes. However, currently available optical fiber sensors are sensitive to changes in temperature and only work well under constant temperature conditions. Megawati's work may help overcome these challenges in signal processing techniques and algorithms.

After obtaining her PhD, Megawati plans to return to Indonesia to join the Bandung Institute of Technology as a member of the teaching staff.