Topic 3:

Parameter identification of the photovoltaic cell model with evolutionary computing algorithms

Supervisor:

Dr. Long Wang

Dr. Long Wang received the MSc degree in computer science with distinction from University College London, London, U.K. in 2014, and the Ph.D. degree in systems engineering and engineering management from City University of Hong Kong, Kowloon, Hong Kong in 2017.

He is currently an Associate Professor with the Department of Computer Science and Technology, University of Science and Technology Beijing, Beijing, China. He serves as an associate editor for IEEE ACCESS and an academic editor for *PLOS ONE*. His research interests include machine learning, computational intelligence, and computer vision. He was an awardee of the Hong Kong PhD Fellowship (success rate: around 1/30) in 2014.

Duration of the project:

Three months (tentatively from May 2019 to July 2019)

Abstract:

Solar energy has attracted growing interest from both of the academia and industry. To better monitor and control photovoltaic (PV) systems, accurate modelling of PV cells is highly desired. Two main phases are typically considered in modelling PV cells. In the first phase, a parametric model is formulated to describe the dynamic behaviors of PV cells. Next, parameters of the parametric model are identified based on collected experimental data. In this project, the parameters of the PV cell model will be estimated via evolutionary computing algorithms, including but not limited to Genetic Algorithm, Particle Swarm Optimization algorithm, and

Jaya algorithm. The performance of different algorithms will be compared, and the sensitivity analysis of algorithm-specific parameters will be conducted.

Preferable Candidates: ☐Undergraduate ☐Master ☐Ph.D ☑All

Required Skills/Knowledge:

Good knowledge of at least one main computer language such as Matlab, Python and Java.

Reference Books/Papers:

1. Wang, Long, and Chao Huang. "A novel Elite Opposition-based Jaya algorithm for parameter estimation of photovoltaic cell models." Optik-International Journal for Light and Electron Optics 155 (2018): 351-356.

2. Luo, Xiong, et al. "Parameter identification of the photovoltaic cell model with a hybrid Jaya-NM algorithm." Optik 171 (2018): 200-203.

3. Wang, Long, Huang, Chao and Huang, Lingmiao. "Parameter estimation of the soil water retention curve model with Jaya algorithm." Computers and Electronics in Agriculture 151 (2018): 349-353.

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