



# Intelligent Computing Research Group

Faculty of Computer Science and Information Technology  
Universiti Putra Malaysia  
Malaysia



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*The Group Mission* We work towards establishing new computational intelligence techniques that transform massive amounts of data into useful information and knowledge. Our main research focus are data mining, machine learning, deep learning, embedded systems & robotics, autonomous systems & software agents, computational linguistics, semantic web, optimization & evolutionary computing, bioinformatics and systems biology

*Applications and Involvements* We believe that our research findings can and will be used in real world applications such as in agriculture, medicine, linguistics, education and learning, biotechnology, information security, and many more.

## GROUP MEMBERS



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### Data Mining & Machine Learning

We concentrate on building knowledge reduction models for data classification as well as discovering strong associations among data by various algorithms for searching frequent patterns. (image, video, web, text, temporal, spatio-temporal)

### Autonomous System & Software Agent

We address seamless interoperability between heterogeneous system and applications such as Internet of Things (IoT) for intelligent environments, prediction models for reasoning and recognition in smart home environment as well as classification of trajectory generation and control of miniature quadrotor used for aerial vehicles.

### Optimization & Evolutionary Computing

We tend to find a better algorithm for solving various combinatorial problems is our main concern. We focus on improving meta-heuristic techniques for solving university timetabling and agricultural problems involving optimization in planting areas and crop systems.

### Computational Linguistics & Semantic Web

We believe that this area is going to play a key role in advanced computing. We deal with the semantic knowledge representation of texts and focus on transforming the learned rules into a model reusable by computer programs. This will enable automation and seamless interoperation between systems in which human intervention is kept at a minimum.

### Bioinformatics & System Biology

Bioinformatics focuses on genome annotation, which is marking the genes and other biological features on a DNA sequence. System biology emphasizes on the study of a whole organisms. We are interested to formulate a novel framework of biology as a system.

## Research Highlights

- A New Optimization Technique With New Metric Formulation For SVM Classifier In Dealing With Imbalanced Datasets
- Object Detection For Multiclass Object Localization And Classification
- Ambient Intelligence For Smart Buildings
- A Novel Extraction Method Based On Curvelet Transform/Gabor Wavelet For Accurate Detection Of Subtle Breast Abnormality From Thermograms
- Self-Adaptive Model To Improve Disambiguation Of Linguistics And Conceptual Mapping In Semantic Question Answering
- An Agent-Based Ontology Fuzzy Logic Conceptual Model For Flood Warning Prediction
- Monitoring Shoreline Change In West Coast Of Peninsular Malaysia

## Selected Publications

- Nurfadhlna Mohd Sharef, Nor Azura Husin, Khairul Azhar Kasmiran, Mohd Izuan Ninggal: Temporal Trends Analysis for Dengue Outbreak and Network Threats Severity Prediction Accuracy Improvement, Journal of Digital Information Management, vol.17, no. 3, pp. 122-132 (2019)
- Kalantar Bahare, Alfian Abdul Halin, HAH Al-Najjar, Shattri Mansor, John L. Van Gendere, Helmi Zulhaidi M. Shafri and Mohsen Zand: A Framework for Multiple Moving Objects Detection in Aerial Videos, in Spatial Modeling in GIS and R for Earth and Environmental Sciences (1st Ed.), pp. 573-588 (2019)
- Azree Nazri, Abdul Azim Abd Ghani, Izuan Hafez, Keng-Yap Ng: A New Theoretical Framework for testing Consciousness in a machine. SCDM. 330-339 (2018)
- Bahareh Kalantar, Shattri Bin Mansor, Alfian Abdul Halin, Helmi Zulhaidi Mohd Shafri, Mohsen Zand: Multiple Moving Object Detection From UAV Videos Using Trajectories of Matched Regional Adjacency Graphs, in IEEE Transactions on Geoscience and Remote Sensing, vol. 55, no. 9, pp. 5198-5213 (2017)
- Mohsen Kakavand, Norwati Mustapha, Aida Mustapha, Mohd Taufik Abdullah: Effective Dimensionality Reduction of Payload-Based Anomaly Detection in TMAD Model for HTTP Payload. TIIS 10(8): 3884-3910 (2016)
- Muhammad Syafiq Mohd Pozi, Md Nasir Sulaiman, Norwati Mustapha, Thingaran Perumal: Improving Anomalous Rare Attack Detection Rate for Intrusion Detection System Using Support Vector Machine and Genetic Programming. Neural Processing Letters 44(2): 279-290 (2016)
- Nurfadhlna Mohd Sharef, Trevor Martin, Khairul Azhar Kasmiran, Aida Mustapha, Md Nasir Sulaiman, Masrah Azrifah Azmi Murad: A comparative study of evolving fuzzy grammar and machine learning techniques for text categorization. Soft Comput. 19(6): 1701-1714 (2015)
- R Yaakob, AH Aryanfar, AA Halin, MN Sulaiman: A Comparison of Different Block Matching Algorithms for Motion Estimation, in Procedia Technology, vol. 11, pp.199-205 (2013)

*For more information regarding the group and the work that we do, or if you are interested in postgraduate supervision at the MSc or PhD level, please do not hesitate to directly contact any of the group members.*



## Entry Requirements

### DOCTOR OF PHILOSOPHY

- A Master's degree (via coursework) in a relevant field with a minimum grade average of B, or
- A Master's degree (by research) in a relevant field, or
- An outstanding Bachelor's degree with a minimum CGPA of 3.750 (direct admission to a PhD program is possible)

### MASTER OF SCIENCE

- A Bachelor's degree in Computer Science, Information Technology or any relevant discipline with a minimum CGPA of 3.00 from a recognized university
- Applicants whose CGPA is between 2.75 and 2.99 may be considered provided at least one(1) year working experience in the relevant field.