



Intelligent Computing Research Group

Faculty of Computer Science and Information Technology
Universiti Putra Malaysia
Malaysia



The Group Mission This research group works towards establishing new techniques that can intelligently transform massive data into useful information and knowledge. The main research areas that we focusing on are data mining & machine learning, embedded systems & robotics, autonomous system & software agent, computational linguistics & semantic web, optimization & evolutionary computing, bioinformatics & system biology

Applications and Involvements We have built solutions for real world problems such as agriculture, medical & pharmaceutical, native language, education and learning, biotechnology, economy, 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

focuses on genome annotation, which is marking the genes and other biological features in a DNA sequence. We implement a software system that is able to locate the genes and other features so we can make initial assignment of function to those genes.

Research Highlights

- A New Optimization with new metric formulation for SVM classifier in dealing with imbalanced datasets
- Object Detection Framework for Multiclass Object Localization and Classification
- Ambient Intelligence for Smart Buildings Using Augmented Predictive Models
- 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

- 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, Thinagaran 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)
- Nor Azura Husin, Norwati Mustapha, Md. Nasir Sulaiman, Razali Yaacob, Hazlina Hamdan and Masnida Hussin (2016). Performance of Hybrid GANN in Comparison with Other Standalone Models on Dengue Outbreak Prediction. *Journal of Computer Science*. Volume 12, Issue 6, Pages 300-306
- Siew Mooi Lim, Md Nasir Sulaiman, Abu Bakar Md Sultan, Norwati Mustapha, Bimo Ario Tejo: New Real-Coded Genetic Algorithm Operators for Minimization of Molecular Potential Energy Function. *Applied Artificial Intelligence* 29(10): 979-991 (2015)
- 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)

Achievements

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Journal (5 recent year)

Copyright

Patent

Graduated phd students

Graduated master students

Number of grants

Total grants.

Entry Requirements

DOCTOR OF PHILOSOPHY

The applicant should possess:

- (a) a Master Degree (with coursework) in a relevant field with a minimum grade average of B, or
- (b) a Master Degree with thesis in a relevant field, or
- (c) an outstanding Bachelor's degree with a minimum CGPA of 3.750 (such an applicant may apply direct admission even without a Master Degree).

MASTER OF SCIENCE

An applicant should have a Bachelor Degree in Computer Science or its equivalent with a CGPA of at least 3.00 from UPM or other universities recognised by UPM, or

Applicants with a CGPA between 2.75 to 2.99 (2.75 \leq PNGK $<$ 3.00), may be considered if they have at least one(1) year of working experience in the related field.