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EDUCATION:

Universiti Putra Malaysia

- **Doctor of Philosophy (PhD)**– Intelligent Systems.
  6-Feb-2015 – 14-Nov-2018
  Awarded as Graduate on TIME (GOT) 2018

  Research Topic: Improving Multi-Resident Activity Recognition in Smart Home Using Multi Label Classification with Adaptive Profiling
  ***Research interests*:** data mining, text mining, image processing, geograpghic information system, machine learning, pattern recognition, human activity recognition, smart home systems, internet-of-things and ambient assisted living environment.
  Supervisor: Assoc. Prof. Dr. Thinagaran Perumal

Universiti Technologi MARA

- **Master of Science** – Information Technology
  Jun-2009 – Feb-2013
  IT Project – DSS Effectiveness: Evaluation of Cimplicity Tracking System at PMSB.
  Evaluate the Effectiveness of Decision Support System Using Qualitative Methodology at Organization, Perodua Manufacturing Sdn. Bhd.
  Supervisor: Assoc. Prof. Dr. Anitawati Mohd Lokman.

International Islamic University of Malaysia

- **Bachelor of Science –** Management Information Systems,
  Jul-1999 – Mar-2003
  IT Project: System Development on Web based application
  'Online Traffic Summons Clearance System'
  Using DHTML, PHP, JavaScript, MySQL (RDBMS).
  Supervisor: Puan Normi Syam Awang Abu Bakar.
- **Matriculation Program –** Economics and Management Sciences,
  Jul-1996 – Jul-1999

ACADEMIC TEACHING EXPERIENCE:

Permanent Senior Lecturer – Department of Computer Science,
Faculty of Computer Science and Information Technology, Universiti Putra Malaysia (UPM)
June 2020 – Current

Lecturer – New Era University College
May 2019 - June 2020

Teaching Bachelor Students subject: Foundation of Business Information Systems, Computer Applications, HCI

Lab Demonstrator – Dept of Computer Science, UPM.
September 2015 – February 2016 (*Embedded Programming - Degree Student)*
April 2016 – September 2016 (*Java Programming I – Degree Student)*

PROFESSIONAL TEACHING EXPERIENCE:

Trainer at SHE (Safety, Health & Environment) Department, Perodua Manufacturing Sdn. Bhd.,
March 2011 – May 2014

- *External staff (Site Supervisor)*
  - Including course development, instructor and assessment for the training module.
- *Internal staff (New and existing)*
  - EMS 14001 Awareness Training

System Trainer at Logistics Department, Perodua Manufacturing Sdn Bhd.,
Sept 2003 – Dec 2008

- *External (350 Vendors and Supplier) and Internal Staff*
  - Including preparation on course for SCMS System development and instructor.
  - Periodically conducted as and when new system improvement has been introduced.

PROFESSIONAL WORKING EXPERIENCE:

PIONEER VICTORY SDN. BHD
Data Consultant cum Lead Data Scientist
Sept 2019 – Current

- Lead a team for Big Data Analytics Kementerian Air, Tanah dan Sumber Asli (BDA KATS).
- Develop BDA for National Hydraulic Research Institute of Malaysia (NAHRIM) under the scope of Malaysia Adaptation Index (MAIN) for vulnerability and adaptation for climate change

JABATAN PENDIDIKAN TINGGI, KEMENTERIAN PENDIDIKAN MALAYSIA
Data Analyst
Pembantu Penyelidik,
Dec 2018 – Mar 2019

- Prepare data analysis for presentation and reports on the research work for **Kajian Penyeragaman Saluran Kemasukan ke Universiti Bagi Program Sarjana Muda**.

GEOINFO SERVICES SDN BHD
IT Project Division,
Research and Project IT Manager,
June 2014 – Mar 2015

- Incharged research team and managed IT project.
  Smart City Spatial Service Delivery Engine (SC SSDE)

- SC SSDE is a Techofund Project that will be taking 30 months of the system development life cycle project to the Local Authority namely Pihak Berkuasa Tempatan (PBT) involving: *Majlis Bandaraya JB, Majlis Perbandaran Langkawi, Majlis Bandaraya Melaka, Majlis Perbandaran Sepang, Majlis Daerah Sepang, Majlis Daerah Kuala Langat.*
- Development of Mobile and Web Application using HTML5 and phoneGap.

PERODUA MANUFACTURING SDN. BHD., RAWANG, SELANGOR
SHE Department.
Senior System Executive, Jan 2011 – Dec 2013

- Managed a team of 6 engineers and executives. Brought in to assemble change-ready information system team, adding compliance measures, handling contractors and stakeholders queries and managing risk. Consolidated 400 of CF Machineries system and Contractor Management System (CMS).

Plant Administration Department.
Senior Executive, 2009 – Dec 2010

- Led transformational changes in plants services affecting zero complaints from plants staffs. Supervised two executive and ten assistant administrations. Frequently presented my work to Assistant Manager. Streamlined cleaning services and hygiene management services into efficient and satisfactory services in the whole plants.
- Increased 20% number of suppliers and promote on-time services and sufficient food and beverages and vending machines suppliers in plants. Open visitors for plant tour as monthly event.

Logistics Department.
System Executive, June 2003 – Dec 2008

- Joined to lead improvements to Supply Chain Management System (SCMS) in inbound and outbound logistics with vendors and Third Party Logistics (TPL). Particularly payment verification to vendors and TPL. Introduced three parties reconciliations system between vendor, TPL and Perodua based on buy-off point, inventory system, ordering and receiving system and 'kanban' system. Managed five Admin Assistants. Oversaw reports for 130 local vendors and oversea vendors Performance. Delivery, Inventory Management System, Accounting and IT.
- Establishing all logistics operation, IT, and accounting functions. Created majority of financial models and professionalized all payment/billing structures. Prepared department with SCMS requirements for SDLC process with in-house developer to meet with department and operations standards. Streamline the procedures at shop floor in term of reducing errors, improving information, and increase productivity—with deployment of 'kanban system' as supply tracking solution utilizing LEAN Systems.

AFFILIATIONS & LEADERSHIP:

Perodua Manufacturing Sdn. Bhd.,
- Competent Trainer: Train the Trainer, November 2013 – Asia IKnowledge Sdn. Bhd.
- ISO 14001: 2004 Internal Auditing , 18-19 July 2012 – Sirim Training
- Culturing The Excellence Of Toyota Production System(TPS) Workshop, 22-23 June 2010 – Alpha Ninjutsu Consulting Sdn Bhd
- Facilitator SHE Department, QCC (Quality Control Circle) for Business Unit Manufacturing – Nov 2011 – Perodua Mfg Sdn Bhd.
- ISO 9001:2000 Awareness Training, 16 Aug 2007 – Quality Dynamics Consultancy

Others:

- 3 Mar 2011: Hazard Identification, Risk Assessment & Determining Controls (HIRARC), KBH Management Services
- 26-27 Sept 2011: Emergency Response Plan and Preparedness, NIOSH
- Member of Prime Minister Hibiscus Award (PMHA) since 2011 (company representative)
- Professional Business Etiquette & Protocol, September 2013 – Asia IKnowledge Sdn. Bhd

RESEARCH EXPERIENCE & ACHIEVEMENTS:

PhD Research (2014-2018): Conducted experimental research method – Under smart home umbrella to recognize the human activity recognition and pattern recognition to track the performer's of the particular activities. The research methods presented using machine learning technique namely Label Combination-Random Forest (LC-RF) method of Adaptive Profiling (AP) to improve the accuracy for multiple residents that reside together in the same smart home premises. The methods proposed using the multi-label classification technique. The activity recognition of multiple residents is introduced with automatically recognize the type of interaction of the multiple residents. Thus, the proposed Two-Stage Label Construction (TSLC) method to cater the complex activity. The proposed methods introduced are also tested under different base classifiers such as SVM, k-NN and HMM using the real-world datasets. Consequently, LC-RF with AP and TSLC methods showed the most promising results among others. The obtained results demonstrate the improvement of 2.4% increment in Hamming score as compare with the highest results from the previous work. Experimental results have significantly promised an improvement level in multiple residents simple and complex activity recognition simultaneously, capable to cater the problems specifically when the number of resident increase and reside together in the same smart home environment.

Master Research (IT Project), February 2013: Conducted qualitative research methods – developed and administered survey instrument, completed interviewing participant with the DSS (Decision Support System) for the organization. This research was attempted to study the DSS used in supply chain environment specifically at Perodua Manufacturing Sdn. Bhd. (PMSB) called Cimplicity Tracking System (CTS) that have been used by the production executives but never being measured its effectiveness. It is also to find issues and barriers that are considered the actual problem of the system implementation being faced. Understanding the issues is vital to identify areas for system improvement as the company needed to improvise in order to increase the level of decision maker satisfaction and provide the decision making more effective. The result is significant for the company's system future improvement in term of quality, efficiency and satisfaction after or while using the DSS system.

Journals (February 2015 – March 2019):

Mohamed, R., Zainudin, M. N. S., Sulaiman, N., & Perumal, T. (2018). Multi label Classification for Physical Recognition from Various Accelerometer Sensor Positions. Journal of Information and Communication Technology, No. 2(18), 209–231. Retrieved from http://jict.uum.edu.my/images/vol17no2apr18/ms209-231.pdf
(Published – Indexed by SCOPUS)

Mohamed, R., Perumal, T., Sulaiman, N., Mustapha, N., & Abd Manaf, S. (2017). Tracking and Recognizing the Activity of Multi Resident in Smart Home Environments. Journal of Telecommunication, Electronic and Computer Engineering, 9(2–11), 39–43. Retrieved from http://journal.utem.edu.my/index.php/jtec/article/view/2735/1793
(Published – Indexed by SCOPUS)

Mohamed, R., Perumal, T., Sulaiman, M. N., & Mustapha, N. (2017). Multi Resident Complex Activity Recognition in Smart Home: A Literature Review. International Journal of Smart Home, Vol. 11(No. 6 (2017)), 21–32. Retrieved from http://www.sersc.org/journals/IJSH/vol11_no6_2017.php
(Published – Indexed by SCOPUS)

Mohamed, R., Perumal, T., Sulaiman, M. N., Mustapha, N., & Zainudin, M. N. S. (2018). Multi Label Classification on Multi Resident in Smart Home using Classifier Chains. Advanced Science Letters, 24(2), 1316–1319(4). https://doi.org/10.1166/asl.2011.1261
(Published – Indexed by SCOPUS)

Zainudin, M. N. S., Sulaiman, N., Mustapha, N., Perumal, T., & **Mohamed, R.** (2018). Two-stage feature selection using ranking self-adaptive differential evolution algorithm for recognition of acceleration activity. *Turkish Journal of Electrical Engineering and Computer Sciences*, *26*(3), 1378–1389. http://doi.org/10.3906/elk-1709-138
(Published – Indexed by ISI)

Zainudin, M. N. S., Mustapha, N., Perumal, T., & **Mohamed, R.** (2017). Recognizing Complex Human Activities Using Hybrid Feature Selections Based on an Accelerometer Sensor. *International Journal of Technology,* 8(5), 968–978. https://doi.org/https://doi.org/10.14716/ijtech.v8i5.7217
(Published - Indexed by ISI)

Zainudin, M. N. S., Sulaiman, M. N., Mustapha, N., Perumal, T., Ahmad Nazri, A. S., **Mohamed, R.,** & Abd Manaf, S. (2017). Feature Selection Optimization using Hybrid Relief-f with Self-adaptive Differential Evolution. *International Journal of Intelligent Engineering and Systems*, 10(3), 21–29. https://doi.org/10.22266/ijies2017.0430.03
(Published - Indexed by SCOPUS)

Zainudin, M. N. S., Sulaiman, N., Musapha, N., Perumal, T., & **Mohamed, R.** (2018). Solving Classification Problem Using Ensemble Binarization Classifier. *International Journal of Engineering & Technology*, *7*(31), 280–284. Retrieved from https://www.sciencepubco.com/index.php/ijet/issue/view/423
(Published – Non SCOPUS / Non ISI)

International Conferences

Mohamed, R., Perumal, T., Sulaiman, M. N., Mustapha, N., & Zainudin, M. N. S. (2016). Multi Label Classification on Multi Resident in Smart Home using Classifier Chains. In 3rd International Conference on Computational Science and Technology 2016 (ICCST2016) Advanced Science Letters, 24(2), 1316–1319(4). https://doi.org/10.1166/asl.2011.1261
(Presenter)

Mohamed, R., Perumal, T., Sulaiman, M. N., Mustapha, N., & Zainudin, M. N. S. S. (2017). Modeling activity recognition of multi resident using label combination of multi label classification in smart home. In AIP Conference Proceedings (Vol. 1891, pp. 400–407). https://doi.org/10.1063/1.5005427
(Best Paper Award) (Presenter)

Mohamed, R., Perumal, T., Sulaiman, N., Mustapha, N., & Razali, M. N. (2017). Multi-Resident Activity Recognition Using Label Combination Approach in Smart Home Environment. In International

Sympossium Consumer Electronics 2017 (pp. 5–7). IEEE. http://doi.org/10.1109/ISCE.2017.8355551
(Presenter)

Mohamed, R., Perumal, T., Sulaiman, M. N., Mustapha, N., & Razali, M. N. (2017). Conflict resolution using enhanced label combination method for complex activity recognition in smart home environment. In 2017 IEEE 6th Global Conference on Consumer Electronics (GCCE) (pp. 1–3). https://doi.org/10.1109/GCCE.2017.8229477
(Presenter)

Zainudin, M. N. S., **Mohamed, R.,** Sulaiman, M. N., Perumal, T., Mustapha, N., & Ahmad Nazri, A. S. (2017). Multi label Classification Using Label Combination to Recognize Human Activity Based on Various Sensor Positions. In ICOCI Kuala Lumpur. Universiti Utara Malaysia (pp. 669–674). Retrieved from http://icoci.cms.net.my/PROCEEDINGS/2017/Pdf_Version_Chap15e/PID63-669-674e.pdf
(Presenter)

Zainudin, M. N. S., Sulaiman, N., Musapha, N., Perumal, T., & Mohamed, R. (2018). Solving Classification Problem Using Ensemble Binarization Classifier. *International Conference on Innovations in Computer Science and Engineering (iCiCSE2018)*, *7*(31), 280–284. Retrieved from https://www.sciencepubco.com/index.php/ijet/issue/view/423
(Presenter)

Mohamed, R., Perumal, T., Sulaiman, N., Mustapha, N., & Yamaguchi, S. (2018). Resolution Mechanism Model for Heterogeneous Systems in Smart Home Environment. In *2018 IEEE 7th Global Conference on Consumer Electronics (GCCE)* (pp. 574–575). IEEE. http://doi.org/10.1109/GCCE.2018.8574779

REFERENCES

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