Dr. HENG EE (OSBERT) TAY, Ph.D.

tayhengee@gmail.com | LinkedIn | Github

Malaysia Teaching Permit for Tertiary Study: PM/IPTS/2023/07/2162

Research Focus:

Digital Health, Social Media Analytics, Interpretability, Generalisability, Applied NLP & Multimodal Data

PhD Research and Contributions:

Thesis Title: **A Generalised Depression Detection Model using Social Media Data**
Research Focus: Detecting depression on social media using user-generated content.
Contributions:

1. **Stacked Embedding Recurrent Convolutional Neural Network (SERCNN)**, a deep learning architecture that comprises a *stacked embeddings* and a *Recurrent Convolutional Neural Network (RCNN)*, in modelling and learning representation of the user data.
2. **eXtreme boosting with Topic modelling (XT)** leverages *pretrained Neural Topic Model (NTM)* and *Gradient-Boosted Decision Trees (GBDT)* models to predict depression with a focus on *robustness* and *interpretability*. XT achieves an average F1 score of 86% across 4 depression datasets.
3. **XT mark II (XT-II)** extends *XT* by incorporating *Prior Knowledge* during the pretraining of the NTM. The transfer learning via Prior Knowledge enhancing both the model's performance and its generalisability across different depression datasets.
4. Proposed **Observation Window** to quantify the posting history in seeking the optimal number of posts for an effective detection of depression, thus reducing the computational cost.

Qualities:

Active listening, Adaptability, Empathy, Effective Communication, Independent, Teamwork, Time & Team Management, Problem Solving & Critical Thinking skills.

Work Experience:

Lecturer @ Xiamen University Malaysia   **Mar 2024 - Present**
- School of Computing and Data Science
- DSC201 Statistical Programming using R, CST210 Object-Oriented Programming-Java,

Tutor @ Monash University Malaysia   **Mar 2019 – Nov 2023**
- Mainly on **Object-Oriented Programming** and **Java** (FIT1051 [2020 - 2023], FIT2099 [2020] & FIT9131[2019]). Also, on Parallel Computing (FIT3143 [2019]).
- Employed **active learning** strategies to engage students in the classroom.
- Achieved a Student Satisfaction Score of **92 (10% more than the faculty's average)** in 2021.

Admin @ Kumaju Tyres & Batteries Enterprise   **Jan 2013 – Oct 2023**
- Played a key role in IT infrastructure (including software) maintenance and support.
- Engaged in direct customer interactions, providing assistance to enhance customer experience.
- Acted as a storekeeper, managing inventory, and ensuring the efficient operation of the store.

Application Developer @ Eco World Project Management Sdn Bhd   **Jul 2018 – Sep 2018**
- Develop in-house web applications for different departments (Sales and Finance) with ASP.Net, C#, MS SQL Server, HTML, JavaScript.

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Education:

PhD Artificial Intelligence @ Monash University Malaysia   **Mar 2019 - Nov 2023**
- Final thesis submitted on 2nd Sep 2023, awarded Doctor Of Philosophy by Monash University Council on 12th Oct 2023, and attended convocation on 26th Nov 2023.
- Awarded **Graduate Research Merit Scholarship**.
- Promoted from MPhil (Mar 2019 – Mar 2020) to PhD.
- Participated **European Union (EU) Horizon 2020 Project (IDENTITY**) **- Marie Skłodowska-Curie Actions - Research and Innovation Staff Exchange (RISE),** as an Early-Stage Researcher at Università degli Studi di Sassari in Italy.
- Three Minutes Thesis (3MT) Competition:
  o [2021] School of Information Technology, Monash University Malaysia: **1st Place**
  o [2021] Monash University Malaysia: **1st Runner-up**
- Developed **Self-Mind**, a mindfulness mobile app for depression risk estimation, which earned a **Silver Award** at ITEX 2022.
- Publication:
  Tay, H.E., Lim, M.K., Chong, C.Y. (2023). SERCNN: Stacked Embedding Recurrent Convolutional Neural Network in Detecting Depression on Twitter. In: Rousseau, JJ., Kapralos, B. (eds) Pattern Recognition, Computer Vision, and Image Processing. ICPR 2022 International Workshops and Challenges. ICPR 2022. Lecture Notes in Computer Science, vol 13643. Springer, Cham.

BSc (Hons) Computer Science @ University of Nottingham Malaysia   **Sep 2015 - Jul 2018**
- Ranked #1 in School of Computer Science and First Class Honours.
- **2nd Runner-up** in **SAS FinTech Challenge 2018** with **Team SharkFin** (Buffget).
- High Achiever Scholar (2015).
- Led the team and won **1st Place** in University of Nottingham Malaysia-Petrosains Design Challenge 2018: Redesign the Periodic Videos Interactive Exhibition.
- **Exchange Student** to study at the UK Campus for 2016-2017.
- Attended Korean Summer School Program (KSSP) at Hannam University in South Korea.

STPM (A-level equivalent) at SMK Seafield   **Jan 2013 - Dec 2014**
- CGPA: 3.92/4.0 [General Studies A-, Mathematics (Management) A, Economics A, Business Studies A]
- Malaysian University English Test – Band 4
- Silver Award for STPM Cohort 2014 for the state of Selangor
- International Competitions and Assessments for Schools MATHEMATICS by UNSW Global - Credit
- Participated in the Victoria University Business Challenge 2014
- Librarian, Treasurer for Young Entrepreneurs' Society (YES)

Languages:
Proficient in English, Mandarin, Cantonese, & Malay speaking and writing.

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Primary Skills:

1. **AI, NLP, LLM, Clustering & Topic Modelling, Computer Vision, Multimodal Analysis & Generative AI:**
   PyTorch, Huggingface, NumPy, Pandas, Scikit-learn, XGBoost, LLAMA2, BERT, OpenAI GPT-4.

2. **Programming:**
   Python 3, Java, C, C++, C#, Android, Flutter, Object-Oriented Programming, MVP

3. **Scripting:**
   HTML5, JS, ASP.Net

4. **Database:**
   SQL (MySQL, SQLite, MS SQL Server), NoSQL (Firebase Firestore), Large Dataset Collection, Annotation, & Cleaning, Advanced Data Visualisation, Qualitative & Quantitative Analysis, Web Scraping

5. **Misc:**
   Prompt Engineering, API development & deployment, Automated DCA Trading, Academic Writing.