# Jirayus Jiarpakdee

## Software Engineering Researcher | Data Scientist | PhD Student

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## Summary


- Experienced in analysing large-scale data to *uncover patterns, trends, and knowledge* across software, e-commerce, and healthcare industries
- Experienced in *communicating advanced analytical concepts with a wide range of audiences* from emergency physicians to decision-support engineers
- Proven effectiveness in both industry and academia (Google Scholar Citations of 142 and H-index of 6), *collaborating with internationally recognised researchers within- and outside-discipline*, publishing in top-tier SE (2*TSE (IF 6.112), 1*EMSE (IF 3.156), 1*ICSE (CORE A*), 1*MSR (CORE A), and 1*ICSME (CORE A)) and Emergency Medicine venues (1 Annals of Emergency Medicine (IF 5.799) and 1 Emergency Medicine Journal (IF 2.491))
- Successfully *mentored projects of undergraduate and graduate students leading to published research papers* (1*ICSE'19 and 1*ASE'20 Tool Demonstration)


## Selected Experiences

**Present – March 2020** | **Data Scientist - External Engagement Project funded by the Medical Research Future Fund (MRFF), Department Health of Australian Government, Australia**

Statistical Modelling | Machine Learning | Hypothesis Testing | Empirical Study | Python | R

- **Topic: Emergency Medicine Patient and Paramedic Wait Time Multivariable Prediction Models using: A Multicentre, Derivation and Validation Study**
- **Goal:** Predict triage-to-provider and paramedic door-to-off stretcher time of patients from 12 emergency departments that satisfy the prediction accuracy of 30 minutes
- **Methodology:** Built multivariate statistical and ML models using administrative data at triage
- **Success:** When tested with unseen data, triage-to-provider prediction accuracy per site varied from 22.6 – 44 minutes, while ambulance door-to-off stretcher prediction accuracy per site varied from 6.3 – 16.1 minutes. To our knowledge, this is the largest study of its kind in emergency medicine to date. The predictive model has been deployed in 2 of the studied emergency departments. 4 other departments expressed their interest and their deployments are currently in progress. Media coverage available at `https://www.monash.edu/it/about-us/news-and-events/latest/articles/2020/how-data-helps-doctors-make-life-saving-decisions-in-emergency-care`

**August 2019 – June 2019** | **Mentor - JITBOT, Faculty of IT, Monash University**

Explainable AI | Github Mining | Empirical Study | Software Quality Assurance | Python | R

- **Topic: JITBot – An Explainable Just-In-Time Defect Prediction Bot**
- **Goal:** Mentor 3 undergraduate students (1) to develop a tool to automatically estimate risks of having defects for each pull request and (2) publish a research article of the tool
- **Methodology:** Constructed an explainable Just-In-Time defect prediction bot to find the most risky pull requests, explain why such pull requests are risky, and suggest risk mitigation plans. Used Agile methodology to manage tasks and deliverables for each week and had daily, weekly, and monthly meetings to adjust plans appropriately
- **Success:** The tool met the requirements from stakeholders (e.g., supervisors). The work was published at the Tool Demonstrations track of the *International Conference on Automated Software Engineering (ASE), 2020*. Demo available at `https://www.youtube.com/watch?v=HJBzULrS6hE`

**October 2017 – May 2017** | **Research Assistant - Software Analysis and Intelligence Lab (SAIL), Queen's University, Canada**

Defect Analytics | Hypothesis Testing | Empirical Study | Software Quality Assurance | R

- **Topic: The Impact of Correlated Metrics on the Interpretation of Defect Models**
- **Goal:** Investigate correlations among software metrics and quantified their impact on the interpretation of defect models
- **Methodology:** Used empirical research to investigate correlations among software metrics and quantified their impact on the interpretation of defect models
- **Success:** Discovered the impact of correlated metrics on the interpretation of metrics and derived 2 practical guidelines for those who wish to derive sound model interpretation: (1) one must mitigate (e.g., remove) correlated metrics prior to constructing models; and (2) one must avoid using ANOVA Type-I even if all correlated metrics are mitigated. This work was published at *Transactions on Software Engineering (TSE)*, the most prestigious journal in Software Engineering.

October 2015 – August 2015

**Software Engineer (Internship) - Ranking Development Team, Rakuten, Japan**

Big Data Mining | Data Visualisation | Spark | Java | JavaScript | SQL

- **Topic: A large-scale transaction analysis: Summary and Trends during Rakuten SUPER SALE**
- **Goal:** Summarise transactions during Rakuten SUPER SALE to uncover trends and generate a summary report for each category of sales
- **Methodology:** Collaborated with the Marketing team to developed a framework to process and analyse transactions of Rakuten Ichiba using Spark and Hadoop Distributed File System
- **Success:** Delivered a framework that can process and analyse transactions of Rakuten Ichiba during SUPER SALE; and generated a summary dashboard and trends of transactions as stated in the requirement from the Marketing team

## Selected Publications

2021

**Predicting Ambulance Patient Wait Times: A Multi-Center Derivation and Validation Study**

Digital Health | Emergency Medicine Research | Wait-time Prediction

- Katie Walker, Jirayus Jiarpakdee, Anne Loupis, Chakkrit Tantithamthavorn, Keith Joe, Michael Ben-Meir, Hamed Akhlaghi, Jennie Hutton, Wei Wang, Michael Stephenson, Gabriel Blecher, Paul Buntine, Amy Sweeny, Burak Turhan
- *Annals of Emergency Medicine*, 2021 (Impact Factor 5.799)

**Practitioners' Perceptions of the Goals and Visual Explanations of Defect Prediction Models**

Explainable Software Analytics | Defect Analytics | Visual Explanation

- Jirayus Jiarpakdee, Chakkrit Tantithamthavorn, John Grundy
- *International Conference on Mining Software Repository (MSR)*, 2021 (Core A, Acceptance Rate 34.3%)

**SQAPlanner: Generating Data-Informed Software Quality Improvement Plans**

Explainable Software Analytics | Defect Analytics | Rule-based Explanation | Model Agnostic

- Dilini Rajapaksha, Chakkrit Tantithamthavorn, Jirayus Jiarpakdee, Christoph Bergmeir, John Grundy, Wray Buntine
- *Transactions on Software Engineering (TSE)*, 2021 (Impact Factor 6.112)

2020

**An Empirical Study of Model-Agnostic Techniques for Defect Prediction Models**

Explainable Software Analytics | Defect Analytics | Software Quality Assurance | Model Agnostic

- Jirayus Jiarpakdee, Chakkrit Tantithamthavorn, Hoa Khanh Dam, John Grundy
- *Transactions on Software Engineering (TSE)*, 2020 (Impact Factor 6.112)
- Media coverage available at `https://www.monash.edu/it/about-us/news-and-events/latest/articles/2020/world-first-bughunter-arc-decra-fellow-develops-ai-that-can-detect-defects-faster`

**The Impact of Automated Feature Selection Techniques on the Interpretation of Defect Models**

Explainable Software Analytics | Defect Analytics | Model Explanation | Feature Selection

- Jirayus Jiarpakdee, Chakkrit Tantithamthavorn, Christoph Treude
- *Empirical Software Engineering (EMSE)*, 2020 (Impact Factor 3.156)

2019

**The Impact of Correlated Metrics on the Interpretation of Defect Models**

Defect Analytics | Hypothesis Testing | Collinearity | Software Quality Assurance

- Jirayus Jiarpakdee, Chakkrit Tantithamthavorn, Ahmed E Hassan
- *Transactions on Software Engineering (TSE)*, 2019 (Impact Factor 6.112)

**Mining Software Defects: Should We Consider Affected Releases?**

Mining Software Repositories | Empirical Software Engineering | Defect Analytics | Software Quality Assurance

- Suraj Yatish, Jirayus Jiarpakdee, Patanamon Thongtanunam, Chakkrit Tantithamthavorn
- *International Conference on Software Engineering (ICSE)*, 2019 (Core A*, Acceptance Rate 20.6%)

2018

**AutoSpearman: Automatically Mitigating Correlated Software Metrics for Interpreting Defect Models**

Explainable Software Analytics | Defect Analytics | Model Explanation | Feature Selection

- Jirayus Jiarpakdee, Chakkrit Tantithamthavorn, Christoph Treude
- *International Conference on Software Maintenance and Evolution (ICSME)*, 2018 (Core A, Acceptance Rate 26%)

## Education

**Present – February 2019** | **Ph.D. - Monash University, Faculty of Information Technology, Australia**

Explainable Software Analytics | Software Quality Assurance | Defect Analytics

- Supervisors: Dr. Chakkrit Tantithamthavorn (Principal supervisor) and Professor John Grundy (Co-supervisor)
- Thesis Topic: *Towards Explainable Software Defect Analytics Models to Support Software Quality Assurance Planning*
- Official Thesis Submission Date: May 16, 2021

**January 2019 – November 2017** | **Ph.D. (Transferred) - The Unversity of Adelaide, School of Computer Science, Australia**

- Supervisors: Dr. Chakkrit Tantithamthavorn (Principal supervisor) and Dr. Christoph Treude (Co-supervisor)

**March 2017 – October 2014** | **M.Eng.IST - Nara Institute of Science and Technology, Software Engineering Laboratory, Japan**

Sentimental Analysis | Stack Overflow

- Supervisors: Dr. Akinori Ihara (Principal supervisor) and Professor Kenichi Matsumoto (Co-supervisor)
- Thesis Topic: *Understanding Question Quality through Affective Aspect in Q&A Site*

**March 2014 – June 2010** | **B.Eng.CE - Kasetsart University, Department of Computer Engineering, Thailand**

*Second Class Honours*, GPA 3.49 out of 4.00

## Technical Skills

**Domains:** Software Engineering | Software Analytics | Software Quality Assurance | Machine Learning | Digital Health

**Skills:** Predictive & Explanatory Modelling | Hypothesis Testing | Supervised & Unsupervised Learning | Data Analytics | Data Visualisation | Data Engineering

**Languages:** R | Python | Java | C/C++/C# | SQL | Shell

## Selected Honours and Awards

**Present – February 2019** | **FIT Research and International Postgraduate Research Scholarships, Monash University**

Full tuition with an annual living allowance of AUD$27,872

**January 2019 – November 2017** | **Beacon of Enlightenment PhD Scholarship, The University of Adelaide**

Full tuition with an annual living allowance of AUD$26,682

**April 2017 – April 2014** | **Monbukagakusho (MEXT) Scholarship, Embassy Recommendation, Japanese Government**

Full tuition with an annual living allowance of 1,728,000 JPY