

# Loong Kuan Lee

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## Education

2019–2023 **Doctor of Philosophy (PhD)**, *Monash University*, Melbourne

2015–2018 **Bachelor of Informatics and Computation Advanced (Honours)**, *Monash University*, Melbourne, Final Mark - 88/100

Specialised in Computer Science and Statistics & Probability. Graduated with First Class Honours.

## Doctoral Thesis

title *Computing Divergences between High Dimensional Graphical Models*

supervisors Geoff Webb, Daniel Schmidt, Nico Piatkowski

year 2023

description We develop a method for computing the joint, marginal, and conditional  $\alpha\beta$  - divergences, a family of divergences that include the Kullback-Leibler divergence and the Hellinger distance. We then apply this method to modifying the parameters of a decomposable model such that the resulting model is some target amount of divergence away from the original.

## Honours thesis

title *Generating Concept Drift by Shuffling Instances*

supervisors Geoff Webb

year 2018

description We propose a method for shuffling the instances in a dataset such that the divergence between the empirical distribution of the first and second half of the resulting dataset reaches some target amount of divergence.

## Experience

Academia

2016–2017 **Undergraduate Research Assistant**, *Monash University*, Melbourne

Researched **Concept Drift**, specifically how to measure and visualise concept drift in both streaming and static data.

Tasks:

- Developed a system to incrementally measure changes to the probability distributions of a data set over time, using **Java** and the library **Weka**.
- Developed a companion web application for the system above using **Scala** with the **Play Framework**, **Javascript**, and **HTML**.
- Used **R** extensively to visualise results and produce reports.

## Industry

- 2016 **Winter Research Project**, *Agilent & Monash University*, Melbourne  
Developed application to compare and analyse large groups of timeseries data over the same domain, using **R** and **Shiny** .
- 2017 **Software Tester**, *Carsales*, Melbourne  
Tested backend APIs being developed to move product from a monolith to a microservice architecture. Helped develop a prototype model to predict car depreciation.  
Tasks:  
- Created automated tests for APIs in CI pipeline using **Postman** , **Node.js** , and **Jenkins** .  
- Carried out performance testing of APIs using **Scala** and **Gatling** .  
- Managed communication across multiple teams to track bugs reported by consumers of the backend APIs and bugs I found in systems the APIs depend on.  
- Developed prototype to predict the depreciation of a car using **R** , **Azure ML Studio** , and **Vue.js** .

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## Scholarship & Awards

- 2015 Faculty of IT International Merit Scholarship  
2015 Dean's Achievement Award  
2016 Summer Research Scholarship — Faculty of IT  
2016 Winter Research Scholarship — Faculty of IT  
2017 Information Technology IBL (Industry Based Learning) Placement Scholarship  
2017 Dean's Achievement Award  
2019 Australian Government RTP (Research Training Program) Scholarship

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## Publications

### Published

Loong Kuan Lee, Geoffrey I. Webb, Daniel F. Schmidt, and Nico Piatkowski. Computing Marginal and Conditional Divergences between Decomposable Models with Applications. In *2023 IEEE International Conference on Data Mining (ICDM)*, pages 239–248, December 2023 .

Loong Kuan Lee, Nico Piatkowski, François Petitjean, and Geoffrey I. Webb. Computing divergences between discrete decomposable models. *Proceedings of the AAAI Conference on Artificial Intelligence*, 37(10):12243–12251, June 2023 .

Geoffrey I. Webb, Loong Kuan Lee, Bart Goethals, and François Petitjean. Analyzing concept drift and shift from sample data. *Data Mining and Knowledge Discovery*, 32(5):1179–1199, September 2018 .