

# JOEL MACKENZIE

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📍 Melbourne, Victoria, Australia  
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## Research Interests

I am primarily interested in the discipline of Information Retrieval, including areas such as efficient indexing and retrieval, ranking, evaluation, and user behavior. I also have a broad interest in data structures and algorithms.

## Education

**Bachelor of Computer Science, Hons.** February 2012 – November 2015  
Honours Thesis: *Efficiency-Effectiveness Trade-offs for Location Aware Search*.  
First class honours.  
RMIT University, Melbourne, Australia.

**Doctorate of Philosophy (Computer Science).** February 2016 – Present  
RMIT University, Melbourne, Australia.

## Experience

**New Media Sales** – Webmaster October 2013 – July 2014  
Maintained an E-Commerce website, including both front-end and back-end development, as well as system administration.

**RMIT University** – Head Tutor/Tutor/Lab assistant July 2014 – Present  
Tutored and assisted in labs for the Operating Systems, Database Systems, Computing Theory and Information Retrieval courses. Head tutor for the Programming Fundamentals course. This involved preparation and delivery of both theoretical and practical knowledge and tasks to students, ranging from programming and algorithms to mathematics and statistics.

**Envato** – Assistant Search Engine Analyst (Intern) January 2016 – April 2016  
Worked with the Discovery team to continue improving search effectiveness across some of Envato's most popular marketplaces. Involved creating tooling for analysis of query logs to gain insights into the search behaviour of users on Envato market.

**RMIT University** – Programmer May 2017 – September 2017  
Data preparation and scripting for the RMIT Computing department for the Australian Research Council's "Excellence in Research for Australia" rankings. Involved writing tools to automatically extract citation information from both Google Scholar and Microsoft Academic, as well as further data preparation and analysis.

**Microsoft Research** – Research Intern June 2018 – September 2018  
Worked with the SQL and the Language and Information Technologies teams to understand user behavior in the email search domain. Involved analysis of user behavior logs from a set of human intelligence tasks related to email search.

## Skills

**Programming Languages:** Awk, Bash, C, C++, Java, Javascript, PHP, Python, and R.

**Databases systems:** MongoDB, MySQL, and Redis.

**Operating Systems:** Linux (Debian and derivatives preferred), Unix (Solaris), Windows, and OS X.

**Tools and Environment:** GNU Toolchain, Valgrind, Eclipse, Vim, Git, and  $\LaTeX$ .

**Learning frameworks:** QuickRank, JForests, and LightGBM.

## Publications

R. Benham, J. Mackenzie, A. Moffat, and J. S. Culpepper: **Boosting Search Performance Using Query Variations**. In *ACM Transactions on Information Systems (TOIS)*, July, 2019.

A. Mallia, M. Siedlaczek, J. Mackenzie, and T. Suel: **PISA: Performant Indexes and Search for Academia**. In *Proceedings of the Open-Source IR Replicability Challenge, co-located with SIGIR (OSIRRC 2019)*, July, 2019.

M. Petri, A. Moffat, J. Mackenzie, J. S. Culpepper, and D. Beck: **Accelerated Query Processing Via Similarity Score Prediction**. In *Proceedings of the 42nd International ACM Conference on Research and Development in Information Retrieval (SIGIR 2019)*, July, 2019.

J. Mackenzie, K. Gupta, F. Qiao, A. H. Awadallah, and M. Shokouhi: **Exploring User Behavior in Email Re-Finding Tasks**. In *Proceedings of the 2019 World Wide Web Conference (WWW 2019)*, May, 2019.

J. Mackenzie, A. Mallia, M. Petri, J. S. Culpepper, and T. Suel: **Compressing Inverted Indexes with Recursive Graph Bisection: A Reproducibility Study**. In *Proceedings of the 41st European Conference on Information Retrieval (ECIR 2019)*, April, 2019.

L. Gallagher, J. Mackenzie, and J. S. Culpepper: **Revisiting Spam Filtering in Web Search**. In *Proceedings of the 23rd Annual Australasian Document Computing Symposium (ADCS 2018)*, December, 2018.

R. Benham, L. Gallagher, J. Mackenzie, B. Liu, X. Lu, F. Scholer, A. Moffat, and J. S. Culpepper: **RMIT at the 2018 TREC CORE Track**. In *Proceedings of the 27th Text REtrieval Conference (TREC 2018)*, November, 2018.

R. Benham, J. S. Culpepper, L. Gallagher, X. Lu, and J. Mackenzie : **Towards Efficient and Effective Query Variant Generation**. In *Proceedings of the First Biennial Conference on Design of Experimental Search and Information Retrieval Systems (DESIRES 2018)*, August, 2018.

J. Mackenzie, C. Macdonald, F. Scholer, and J. S. Culpepper: **On the Cost of Negation for Dynamic Pruning**. In *Proceedings of the 40th European Conference on Information Retrieval (ECIR 2018)*, March, 2018.

J. Mackenzie, J. S. Culpepper, R. Blanco, M. Crane, C. L. A. Clarke, and J. Lin: **Query Driven Algorithm Selection in Early Stage Retrieval**. In *Proceedings of the 11th International ACM Conference on Web Search and Data Mining (WSDM 2018)*, February, 2018.

J. Mackenzie, F. Scholer, and J. S. Culpepper: **Early Termination Heuristics for Score-at-a-Time Index Traversal**. In *Proceedings of the 22nd Annual Australasian Document Computing Symposium (ADCS 2017)*, December, 2017. Runner up best paper award.

L. Gallagher, J. Mackenzie, R. Benham, R-C. Chen, F. Scholer, and J. S. Culpepper: **RMIT at the NTCIR-13 We Want Web Task**. In *Proceedings of the 13th NTCIR Conference on Evaluation of Information Access Technologies (NTCIR 2017)*, December, 2017.

R. Benham, L. Gallagher, J. Mackenzie, T. T. Damessie, R-C. Chen, F. Scholer, A. Moffat, and J. S. Culpepper: **RMIT at the 2017 TREC CORE Track**. In *Proceedings of the 26th Text REtrieval Conference (TREC 2017)*, November, 2017.

J. Mackenzie: **Managing Tail Latencies in Large Scale IR Systems**. In *Proceedings of the 40th International ACM Conference on Research and Development in Information Retrieval (SIGIR 2017)*, August, 2017.

M. Crane, J. S. Culpepper, J. Lin, J. Mackenzie, and A. Trotman: **A Comparison of Document-at-a-Time and Score-at-a-Time Query Evaluation**. In *Proceedings of the 10th International ACM Conference on Web Search and Data Mining (WSDM 2017)*, February, 2017.

J. Mackenzie, R-C. Chen, and J. S. Culpepper: **RMIT at TREC 2016 LiveQA Track**. In *Proceedings of the 25th Text REtrieval Conference (TREC 2016)*, November, 2016.

J. Mackenzie, F. M. Choudhury, and J. S. Culpepper: **Efficient Location-Aware Web Search**. In *Proceedings of the 20th Annual Australasian Document Computing Symposium (ADCS 2015)*, December, 2015.

## Awards and Funding

**RMIT Vice Chancellors List Award:** Awarded for ranking in the top 2% of higher education in both 2014 and 2015.

**Australian Postgraduate Award:** PhD scholarship from 2016 to 2019.

**SIGIR Travel Award:** WSDM 2017, SIGIR 2017.

**RMIT TIGER/BDDA Group Student paper award:** For WSDM 2018 paper.

**Best Paper Award:** ADCS 2015, Runner up ADCS 2017.

## Professional Services

### Reviewer

Australasian Document Computing Symposium: 2016 and 2017.

International ACM Conference on Research and Development in Information Retrieval: 2016 and 2017.

The International Journal on Very Large Databases: 2017.

The Journal of Information Science: 2019.

International Symposium on String Processing and Information Retrieval: 2019.

### Program Committee Member

Australasian Document Computing Symposium: 2018.

International ACM Conference on Information and Knowledge Management: 2017, 2018, and 2019.

International ACM Conference on Research and Development in Information Retrieval: 2019.

### Proceedings Chair

International ACM Conference on Web Search and Data Mining: 2019.

## References

References and academic transcripts can be provided upon request.