Joel Mackenzie

 Melbourne, Victoria, Australia
 https://jmmackenzie.io
 joel.mackenzie@rmit.edu.au

Education

Doctorate of Philosophy (Computer Science). February 2016 – October 2019
PhD Thesis: *Managing Tail Latency in Large Scale Information Retrieval Systems.*
RMIT University, Melbourne, Australia.

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.

Work Experience

RMIT University – Research Assistant October 2019 – Present

Microsoft Research – Research Intern June 2018 – September 2018
Worked with the SQI 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.

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.

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.

Teaching Experience

RMIT University July 2014 – Present
- ✦ Database Systems – Tutor and lab assistant.
    - ✧ Semester 1, 2015.
    - ✧ Semester 1, 2019.
- ✦ Information Retrieval – Tutor.
    - ✧ Semester 1, 2017.
    - ✧ Semester 1, 2018.
- ✦ Programming Fundamentals – Head tutor.
    - ✧ Semester 1, 2018.
- ✦ Computing Theory – Tutor.
    - ✧ Semester 1, 2015.

✦ Operating Systems Principles – Tutor and lab assistant.

  ✧ Semester 2, 2014.

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, and how we can continue to efficiently handle extremely large data.

Publications

R. Benham, J. Mackenzie, A. Moffat, and J. S. Culpepper: **Boosting Search Performance Using Query Variations.** In *ACM Transactions on Information Systems (TOIS)*, October, 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 university-wide, 2014 (BSc) and 2015 (BSc, Hons).
Australian Postgraduate Award: PhD scholarship from 2016 to 2019.
SIGIR Travel Award: WSDM 2017, SIGIR 2017.
RMIT TIGER/BDDA Group Student Paper Award: For *"Query Driven Algorithm Selection in Early Stage Retrieval"* (WSDM 2018).
RMIT CIDDA CReD Research Excellence Award: For *"Exploring User Behavior in Email Re-Finding Tasks"* (WWW 2019).
Best Paper Award: ADCS 2015, ADCS 2017 (Runner up).

Professional Services

Reviewer
Australasian Document Computing Symposium (ADCS): 2016 and 2017.
International ACM Conference on Research and Development in Information Retrieval (CIKM): 2016 and 2017.
The International Journal on Very Large Databases (VLDB): 2017.
The Journal of Information Science: 2019.
International Symposium on String Processing and Information Retrieval (SPIRE): 2019.

Program Committee Member
Australasian Document Computing Symposium (ADCS): 2018 and 2019.
International ACM Conference on Information and Knowledge Management (CIKM): 2017, 2018, and 2019.
International ACM Conference on Research and Development in Information Retrieval (SIGIR): 2019.

Proceedings Chair
International ACM Conference on Web Search and Data Mining (WSDM): 2019.

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.

Search Engine Tools: PISA, Indri, and Terrier.

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