

# MATT CRANE

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## SUMMARY:

I am a software engineer current working at Instacart on the machine learning infrastructure team. I am deeply interested in the machine learning space, with a focus on building efficient infrastructure to support large scale machine learning system needs. Prior to joining Instacart I was a Research Scientist working on the ads delivery platform at Meta, and a research history in NLP, Search, and Recommender Systems.

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## EXPERIENCE:

**Machine Learning Infrastructure Software Engineer**, Instacart, CA, USA **November 2021–present**

- ✓ Developed a multi-year vision for the team, which served as the basis for cross-company initiatives.
- ✓ Mentored junior engineers on the team through career development to senior levels.
- ✓ Re-wrote key feature store infrastructure resulting in: 10x p99 latency improvement; 10x fewer instances. The store currently serves 30 million features per second with a 20ms p99 latency.
- ✓ Identified multi-million dollar savings by improving and documenting engineering best practices.

**Research Scientist**, Meta (*fka Facebook Inc.*), CA, USA **July 2018–November 2021**

- ✓ Led a team of eight engineers across multiple teams to develop a new data model for the ads delivery system. This model serves 20% of Meta ads revenue, and unlocked 1.8% additional revenue through infrastructure savings.
- ✓ Led the development of a new rule-/hint-based advertising product with a small team of senior engineers, proactively keeping XFN partner teams and leadership updated. Alpha release showed improved advertising performance (66% ROI), and positive sentiment (85%) from advertisers.
- ✓ Worked with team to identify causes of unsustainable/unstable ad delivery and unpredictable performance. Engineered solutions to these issues, which included large scale feature and model migrations. Mentored an intern to return offer as a part of this project. Resulted in 5% revenue and overwhelming gains in business-sensitive advertiser experience metrics.
- ✓ Designed and implemented an extension of the Meta ads experimentation platform to support arbitrarily segmented demand-side experiments.

**Postdoctoral Fellow**, University of Waterloo, ON, Canada **March 2016–February 2018**

- ✓ Investigated machine learning reproducibility and replicability of NLP and information retrieval systems.
- ✓ Mentored postgraduate students in their research areas, thesis and paper writing.
- ✓ Taught CS241, an undergraduate course in building compilers.

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## SKILLS:

Programming languages; strong: Rust, Python, C++; moderate: SQL, Go, C, Typescript, etc.

Tools: Docker, Kubernetes, ECS, Terraform

Systems: AWS, Datadog, Snowflake

Troubleshooting and debugging of large, complex systems.

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## EDUCATION:

**PhD – Computer Science**, University of Otago, New Zealand **February 2012–March 2016**

Thesis: *Improved Indexing & Searching Throughput*

<http://ourarchive.otago.ac.nz/handle/10523/6223>

Investigating ways to improve the efficiency of indexing and searching of web-scale collections without impacting on the effectiveness of the results. During my candidature I was an active member of the academic community, presenting and reviewing at multiple SIGIR, ICTIR, CIKM, and ADCS conferences and workshops.

**MSc (Thesis Only) with Distinction – Computer Science**, University of Otago **October 2009–May 2011**

Thesis: *The New User Problem in Collaborative Filtering*

<http://otago.ourarchive.ac.nz/handle/10523/1938>