

15-400 Project Milestones: Using Just in Time Compilation to Implement an In-Memory Database Key Comparator

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1 Major Changes

There have been no major changes in the implementation of my project proposal.

2 Accomplishments

I have read the three papers mentioned in my literature search (see [1], [2], and [3]. I have also read Permutable Compiled Queries: Dynamically Adapting Compiled Queries Without Recompiling by Prashanth Menon et al. This is Prashanth's paper on JIT compilation applied toward query execution.

I probably need to do a deeper read of each paper and also review compilers material before I start my research project.

3 Meeting Your Milestone

I met only part of milestone that I set for the beginning of the semester. Although I did read the research papers in the way that was specified in class, I do not think I understood the background completely in the papers. I also did not review extra compilers material and the code in NoisePage. I will definitely do it over winter break though!

4 Surprises

There have not really been any surprises, other than the (not) surprise that the week after Thanksgiving and finals week were going to be busy. I'm slightly behind on my literature search but will be able to catch up once the semester finishes.

5 Revisions to Original Milestones

I will possibly change the 125% milestone to include more features, instead of just improving testing and benchmarking interfaces. I will talk to Prashanth about it very soon!

6 Resources Needed

I am set with software! Relevant software is readily available, and I already have a development environment with NoisePage, the CMU DB Group's DBMS, set up on my computer.

I learned that I will likely need a stronger computer (with a CPU of around 40 to 80 cores) to run benchmarking on, but the CMU Databases Group has access to those, so that should be fine!

References

- [1] V. Alvarez, S. Richter, X. Chen, and J. Dittrich. A comparison of adaptive radix trees and hash tables. In *2015 IEEE 31st International Conference on Data Engineering*, pages 1227–1238, 2015.
- [2] Robert Binna, Eva Zangerle, Martin Pichl, Günther Specht, and Viktor Leis. Hot: A height optimized trie index for main-memory database systems. In *Proceedings of the 2018 International Conference on Management of Data*, SIGMOD '18, page 521–534, New York, NY, USA, 2018. Association for Computing Machinery.
- [3] Viktor Leis, Florian Scheibner, Alfons Kemper, and Thomas Neumann. The art of practical synchronization. In *Proceedings of the 12th International Workshop on Data Management on New Hardware*, DaMoN '16, New York, NY, USA, 2016. Association for Computing Machinery.