

Essay on Research Methodology

Manfred Dellkrantz

June 22, 2016

1 Research Topic

The topic of my research is resource optimization of server-based systems using control theory. As the above implies I attempt to minimize the amount of used resources in server-systems, mostly cloud applications, while maintaining a high enough quality of service for the users.

2 Current Research Methodology

As in many of the engineering-based areas of research my research is mostly about identifying a problem, finding the right tools for solving it and then evaluating the proposed solution. This method has many similarities, but differs slightly from the scientific method¹. While you in the scientific method are supposed to base research on a research question, the engineering take on research is rather to base work on a problem that you want to solve. In my case the problem is typically that we want to keep the number of servers in use to a minimum, given a set of circumstances, such as server specifications or models, load scenario or user behavior while maintaining measured metrics from the application running on the servers below a certain limit.

3 Alternative Research Methodology

During the course day my group discussed a paper that one of the group members had brought. This paper was about evaluating a specific way of programming your smart home. Parts of the work done for the paper was that the authors had made interviews with technology-interested people, presumed to be the target group of smart home systems. We discussed in the group whether interviews could be used as a method of research in our own work. One of the group members, working on robot trajectory generation, thought it could be useful to do interviews with users of robots to advance his research. In my case I think interviews would not be a good way to do research. Since my research is more about what happens behind the scene of the cloud application, the only

¹https://en.wikipedia.org/wiki/Scientific_method

thing a presumed user could say in interviews, or even if I would let them try a system using algorithms I developed for resource management, the interviewee could only answer if the quality of the service was good enough or not. And generally the quality of the service can be measured in other ways.

Another paper we discussed was basically a presentation of an open-source software package that had been developed at a US university. The paper presented the problem which the software was supposed to solve, the general idea behind its architecture, some implementation issues and an evaluation of whether the software was able to solve the stated problems. This is something that I might do some time during my work as researcher. Packaging algorithms developed during research into software which is actually useful in production would be a very interesting contribution.

We also discussed publishing code, or “artifacts” related to a published paper. In this case the publishing of the code would not be the central point, but rather a way of empowering the results presented in the paper by allowing peers to repeat and rerun the evaluation of the published work. This would also be an addition to my work that would fit me very well. Also it would mean that I would have to force myself to write better, more readable code.