



BA/SA/MA/Group/Lab:

Contention Management

You live in an apartment and share a big television with other “friends” in the apartment. If you feel an urge to watch the television and you turn out to be the only one with that urge, then there is no doubt that you will get the remote. However, if several of your friends happen to have the same urge, except that they want to see a different channel, it can take sometime before the exclusive owner of the remote is decided upon.

The problem mentioned above also manifests itself in designing algorithms where multiple threads try to access the same memory location. These algorithms typically use some synchronization instructions such as compare-and-swap or fetch-and-add to coordinate shared access. However, the cost of using such synchronization instructions might depend on the number of processes involved.



So, a simple asymptotic analysis that assigns a unit cost to each of the synchronization instruction might not give a true picture of performance cost.

In this thesis we want to start with measuring the performance of some simple synchronization algorithms ¹ on a multi-processor system. The goal is to model the underlying synchronization mechanism of a typical multi-processor so as to explain the observed performance, and possibly, suggest improvements to the synchronization mechanism. If you find this interesting or would like to know more, please feel free to contact us.

Requirements: Interest in designing, implementing and analyzing concurrent algorithms.

Interested? Please contact us for more details!

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¹<https://www.tik.ee.ethz.ch/file/68c636f2c14ee9a226e1d5cc91b25c03/counting.pdf>