

# ECE5658

## Critiques - week1

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## 1 Exokernel

(1) **summary of the paper:** This paper is about, in my words, user level kernel. It gives application opportunity to engage in kernel level control. Every application have chance to improve their performance by controlling hardware resource or editing kernel code and library, but usually they can't. *Exokernel* implement these with in application-level library, which was in kernel code in traditional kernel.

(2) **strengths/weakness of the paper:** *Exokernel* implement kernel primitive simply. That makes basic primitive works faster than traditional kernel's and it results low-level secure multiplexing of hardware resource faster. Moreover, application on *exokernel* can go faster by modifying small part of library to achieve special purpose. However, Applications are granted ability to edit kernel related library can cause some security issues, even though *exokernel* work hard to protect malicious attempt.

(3) **any suggestions to improve their idea:** I'd like to say don't migrate kernel to user, but user can ask kernel to modify some kernel source code. It means kernel behave normally just do as traditional kernel do, except user ask for modifying kernel code. Then kernel securely check user's request and act what user request just for that user.

## 2 Lottery Scheduling

(1) **summary of the paper:** *Lottery scheduling* conceptually works just like real world lottery system. Each allocation get lotteries and each round lottery scheduler pick winner and schedule it. Priority can be achieved by giving or taking from clients.

(2) **strengths/weakness of the paper:** *Lottery scheduling* support responsible control over the relative execution time. It is important that it was needed in system that have varying importance. Also, its idea and implementation are relatively easy so it has advantage on adapting this idea to existing components. Randomly scheduling would not cause starvation at all, however, urgent process must be run at that instance can fail to complete its work on time.

(3) **any suggestions to improve their idea:** For long time sleep process or urgent process waking up immediately, we can introduce '*a joker card*' instead of inflation of lotteries. The owner always wins the lottery and be served as soon as possible.