

CISC 7310X
C01d: Some Opinions on
Systems Research

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Acknowledgement

- These slides are a revision from
 - Andrew S. Tanenbaum and Herbert Bos. 2014. Modern Operating Systems (4th ed.). Prentice Hall Press, Upper Saddle River, NJ, USA.

Computing Research

- Computation is synthetic
 - Different from natural sciences, such as, biology and physics
 - We create and study artifacts - must show the artifacts are "better"
- Two paradigms
 - Theory and experimentation
 - Theory: Similar to mathematics of an abstract phenomena
 - Experimentation: Property of artifacts
 - System research are largely experimental.

"Better" Property

- Examples

- "solves a problem in less time"
- "solves a larger class of problems"
- "is more efficient of resources"
- "is more expressive by some criterion"
- "is more visually appealing in the case of graphics"
- "presents a totally new capability"

What Makes it Better?

- The “better” property is not simply an observation
- More about postulating that a new idea that something fundamental leads to the “better” result
- Examples
 - Data structure, algorithm, language, mechanism, process, representation, protocol, methodology, optimization or simplification, and model

Research and Practice

- “Research” is broadly defined.
- In practice, the same principle applies
 - When you design a system solution, is it because this is the first design that comes to your mind or it is a better design?

Questions?