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Notes for Wednesday, May 6 2009

What are people doing these days in research?

❖ In the last three or four years these are what people are doing:

Discussions:

❖ Right now networking is a separate idea from operating systems.

Topics:

Protection and communication abstractions.

Platform for remotely monitoring the client-side behavior of web 2.0 applications.

Security web applications via automatic partitioning.

There's theoretical stuff about synchronization – Byzentine Fault Tolerance.

Concurrency. We can avoid concurrency problems, by backing out to a saved state.

Software Robustness, ensuring that software does not crash.
❖ Examples: Bouncer: Securing Software by Blocking Bad Input.

System Maintenance. Software Testing Distribution,
❖ if we have software updates, we have to get them to the users.

Windows is supposed to run with every single peripheral connected to it.

Energy and Power, from a generalized thing, power is being wasted.

Going on in operating systems and hardware. Storage is becoming very cheap, but we have problems managing it.

❖ We have to make sure we can find our files.

❖ Kicking a disk doesn't crash and lose all information.

Operating System Security.

File system reliability,

Information flow control
❖ Separating the kernel of the operating system and being able to debug it.

Virtual Architecture.

More Topics:

Virtualization

Page Walks for virtualized Systems.
Power Issues.

Programming – Enhancing OOP performance.

Microarchitecture.

Performance.

The Design and Implementation of Microdrivers.

Operating System Benchmarking.

Compiler instruction scheduling,
  ❖ code generation meets the pipeline

Parallelism,
  ❖ programming model for heterogeneous mutli-core systems.
  ❖ Streamware – programming general purpose multi core processors using streams.

Security and bugs parallelizing security checks.

VPFS = Virtual Private file system.

More on Topics, please see this pdf that I found online that is the same as the one shown in lecture.

http://nstl1.nstl.gov.cn/pages/2008/50/61/42(4).pdf

Code replacement for running programs
  ❖ Real time updating.

Zero-Day Exploits
  ❖ Security.

There's a whole lot of work on security.

Thin-Client Computing
  ❖ A client computer that depends on a main processing server to process most of its activities

Personal View of Important Issues:

The world is becoming one large distributed computer system with file migration, process migration, load balancing, distributed transparent file system, etc.

  ❖ This suggests that the important issues are:
      o Efficient ways to write reliable OS
      o With high performance
      o File migration algorithms

- Load balancing
- Distributed transparent file system implementation
- Wireless and mobile systems
- Supporting mobility
- Location and naming issues
- Energy management
- Security

Grad School Topic

I googled what the professor showed in class about the unpredictability of computer science graduate school admissions and found the text. I hope that this is helpful.

http://cacm.acm.org/magazines/2007/3/5719-the-unpredictability-of-computer-science-graduate-school-admissions/fulltext

Why go to grad school
- ❖ BS degree is not sufficient training
- ❖ Advanced degree good for career
- ❖ Getting job
- ❖ Getting good salary
- ❖ Affects type of work you do
- ❖ Make contacts, friends
- ❖ People take you more seriously

Which degree?
- ❖ Bs = basic technical work
- ❖ Ms = more design responsibility, more independence
- ❖ Ph.D. = research, design, teaching

  - 55k to 62k BS degree
  - 72k to 76k MS degree

When to Apply?
- ❖ Deadlines typically between Nov to Jan. for fall
- ❖ Some schools admit in mid-year

Now or Later?
- ❖ You'll appreciate grad school more and get more out of it if you work for a while.
- ❖ But it is difficult to return to school after work.

How long does it take?
- ❖ MS 1-3 years, depending on the thesis/project
- ❖ PhD 3-10 years 5-6 average. Increasing

Where to go?
- ❖ Try to go to a good school
- ❖ Personal opinion – in a reasonable location
- ❖ Large departments give you a choice of faculty and area of concentration. But some departments are strong or weak in certain areas.

Where are you going to get in?
- ❖ Depends on grades, GREs, recommendations, statement.
- ❖ Some faculty emphasize "smart"; some emphasize research experience. Statement should make sense, not say anything stupid.
- ❖ Make sure grammar, spelling, are okay.

Recommendations
- ❖ Typically 3 required
- ❖ Can supply more (but not more than 5-6) if you have both industrial and academic recommenders.
- ❖ But more are not necessarily better.
- ❖ Try to use the original form
- ❖ Financial support
- ❖ At good schools, almost all PHD students are supported
- ❖ Fellowships
- ❖ Research assistantships
- ❖ Teaching assistantships
- ❖ At weaker schools, support may or may not be provided
- ❖ Ms students get support only if funds available.

Stay at Berkeley?
- ❖ Generally recommended to change schools
- ❖ But not if quality/ location far inferior