CS680v
Virtualization

http://www.cs.binghamton.edu/~kartik/cs680v

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Goals of this course

❑ System virtualization (primary focus)

❑ Distributed systems

❑ Networking subsystems

Pre-requisites

❑ **CS552 – Operating Systems**

❑ **Proficiency with C or C++.**

❑ **Kernel programming experience is essential for most projects**
  ○ If you don't have this background, please try to go over the assignment 1 in my CS552 class last year.

General Info

❑ **Instructor** : Kartik Gopalan

❑ **Location** : Room T-4, Engineering Building

❑ **Email** : kartik@binghamton.edu

Textbooks

❑ No required textbook

❑ Mainly papers posted online

❑ Recommended Textbook :
  ○ **Virtual Machines –** Versatile Platforms for Systems and Processes
    By James E. Smith and Ravi Nair. Publisher: Morgan Kaufmann. ISBN: 1-55860-910-5.

❑ More on course website

Evaluation Criteria

❑ 50% - Course Project
❑ 25% - Paper presentation and summaries
❑ 10% - Midterm
❑ 15% - Final

Accounts

❑ Bingsuns account
  ○ Announcements etc will go to this email ID.

Questions

- Email me (kartik@binghamton.edu)
  - Emails do get lost, so if you don't hear from me in couple of days, please email me again.

- Make Google your friend!

- Office hours:
  ○ Can meet mostly anytime, but please email me one or two days in advance to set up an appointment.

Class Structure

❑ Papers announced a week in advance
  ○ Closely related to class projects
  ○ Usually 1 or maybe 2 papers per week

❑ *Everyone* expected to read and summarize the paper
  ○ Please email me your summary *BEFORE* class
  ○ Also bring a printout of the summary to class, or have it online so you can refer to it.

❑ One of us (me or the students) will lead the class discussion on the paper.
  ○ We will then go around the class having each student discuss their summary.

❑ Sometimes we'll devise mini-experiments to test our theories or questions that you go back and try in the lab.

Reading and Summarizing Papers

❑ Excel at separating out the key ideas in the paper from incidentals

❑ Have a good understanding of how the ideas relate to broader context.

❑ Clearly isolate the problem description and motivate why the problem is important

❑ Clearly identify the contributions compared to prior work

❑ Delve into the meat of the paper and understand what is important

❑ Understand key performance results and their significance

❑ Constructively critique the work.
  ○ What's missing?
  ○ If you were to do it better, then what would be different?

Some project areas

❑ Virtualization for Data-intensive applications (TeraCloud)
  ○ Shared Namespaces with Reliability – Zhao Lin

❑ VM Migration
  ○ Parallel VM Migration - Xiaoshuang
  ○ Hybrid VM migration – Umesh
  ○ Page Sharing and Migration – Beilan
  ○ Virtual Cluster migration

❑ Virtualization and Grid
  ○ Condor and VMs - Beilan

❑ Virtualization and Real-time systems
  ○ Performance of RT apps in VM on KVM - Sergey

❑ Network Emulation and Virtualization
  ○ NS3 on Mint testbed - Francis

❑ Embedded Device Virtualization
  ○ Open for topics

❑ Virtualization and Security
  ○ Open for topics

❑ Regular one-on-one meetings and Periodic project reports

Tentative Project Deadlines

❑ Problem Definition/Related work/Initial results
  ○ Feb 19th

❑ Design/Prototype
  ○ March 26th

❑ Project Presentation
  ○ April 23th

❑ Demo/paper
  ○ By Last day of classes