BTP Topics

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April 2014

http://www.cse.iitb.ac.in/synerg/doku.php?id=public:projects
Bhaskaran Raman: Nature of Projects

• Understand existing literature
• Design of system, algorithms, optimizations
• Hands-on system building
• Prototype evaluation
• Prefer 1-year long: BTP-1 + BTP-2
  – Only one sem: talk to me for R&D
Communication Assisted Road Transportation Systems
CARTS Projects

• Crowdsourcing from smart/dumb phones
  – Scalable data collection
  – User incentivization
  – Data cleaning

• Power efficiency in smart phones
  – Use of inter-phone communication
  – Use of inexpensive sensors (e.g. accelerometer)
Copy Prevention System

• **Problem:** copying in assignments, reports
  – Affects learning
  – Unfairness
  – Breaks system in the long run

• **Goal:** Prevent “cut-paste” copying altogether

• **Challenges:**
  – Allow “any” editing environment
  – Allow “cut-paste” within students’ code
  – Solution should be scalable

• **Status:** Initial design+prototype using X proxy

• **Further:** scaling studies, performance enhancements, usability features
Kameswari Chebrolu
E-Learning Platform

• Version-4: Mostly developmental work based on Django/python framework
  – Student progress tracking; Video rendering; offline mode of access etc

• Lab Support: Scope for research
  – Support Network, Database, Architecture labs
  – Synerg faculty will be involved for feedback
  – Virtualization; Scalable architecture; Support low-bandwidth clients
  – Backend work: need good coding skills
E-Learning Platform

• Auto-grader: Mostly developmental work
  – Joint with Bhaskar and Varsha
  – C/C++

• Scalability/Performance testing: Scope for research
  – Joint with Varsha
  – Build tools for tests; tackle performance bottlenecks
  – Need good coding and analytical skills
WiFi in Classrooms

• How to scale Wifi to support smartphone use in classroom settings?
  – Research based
  – Implementation based work involving Wifi drivers, Android platform
Energy Profiling

• How to improve life of Smart-phones/Aakash tablets?
  – Usage scenario: Watching videos, Web browsing, Exam taking
  – Research based
    • Energy profiling, traffic shaping, web-design
  – Implementation based work involving android platform, Html5 framework
Summary

• Impactful Work:
  – Immediate use. Your juniors (others as well) will bless you 😊

• Hands-on Work: Ideas have to be implemented and evaluated

• Research work has scope for publications

• Details:
  http://www.cse.iitb.ac.in/synerg/doku.php
Mythili Vutukuru
Nature of Projects

• Each project is one year duration.
• Pre-requisites: interest in networking / systems, good coding skills.
• All the projects will entail reading research papers, building prototypes, running experiments and simulations.
• Talk in person for more details
Wireless Routing Security

• Routing and forwarding over multihop wireless networks is inherently insecure, and is susceptible to many kind of attacks.
• The first part of the project will be in understanding existing solutions, the assumptions, security models, performance overhead.
• The next part of the project will be in coming up with practical, deployable solutions to wireless security.
• This project will likely require simulation / prototyping kind of work.
Android Malware Detection

- Understanding the behavior of Android malware
- Measuring and understanding the detection rate and usability of existing malware detection tools
- Coming up with new Android malware samples that can evade detection using existing methods (this will give us an insight on what is broken with current malware detection)
- Finally, using the insights generated to build better malware detection techniques
Network Function Virtualization

• Details in Umesh/Varsha’s presentation...