Dr. Firat Tekiner - Home Page

Main - Dr. Firat Tekiner
Personal
PhD Scholarship
Research
Teaching
Publications
MSc/Final Yr Projects - Data Mining
MSc/Final Yr Projects - Networking

Project Ideas

Project suggestions for UCLAN Computing students. Use the projects below as a guidance to prepare your prroject proposals after discussing with me.

Computer Communications and Networking Projects

Project 1 - Investigate MANET Security issues

- Aim: Investigatesecurity issues in MANETs
- Goal: It is hoped that project will provide a useful guide for understanding the behaviour of MANET and provide possible security solutions
- Tool: OPNET Modeller

PhD Projects Available!

PhD projects are available for exceptionally good candidates in Computer Science/Engineering for EU/UK Nationals in the areas of High Performance Computing, Data Mining and AI applications on MANET routing.

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Project 2 - Investigate MANET Routing Protocols

- Aim: Investigate performance of MANET routing protocols.
- Goal: It is hoped that project will provide a useful guide for understanding the behaviour of MANET routing protocols
- Tool: OPNET Modeller or NS-2
- Routing Protocols to investigate: AODV, DSR, OLSR, OPSFv3, TORA
- Performance Criteria: Packet Delay, Throughput, Adaptability, Quality of Service, etc

Project 3 - Virtualisation as good as standalone servers?

- Aim: Investigate performance of a number of applications using different operating systems as standalone servers and virtualised servers
- Goal: Identify advantages and disadvantages of using virtualisation
- OS: Windows 2003/2008 or Linux
- Virtualisation: VMWare, Microsoft, Linux Flavours
- Applications: defined by student
- Issues to investigate: security, manageability, performance, possible problems that may arise, etc

Project 4 - Nature Inspired Routing Algorithms

- Aim: Investigate performance of nature inspired routing algorithms
- Goal: Investigate the performance of routing algorithms under varying traffic models and changing network conditions
- Simulation Tool: OPNET or NS-2
- Routing Algorithms to investigate: AntNET or Behive or GA Based Routing Algorithms
- Performance Criteria: Packet Delay, Throughput, adaptability to problematic conditions

Project 5 - Investigate Routing Protocols for different Traffic Models

- Aim: Investigate performance of routing protocols for different traffic models and network topologies.
- Goal: It is hoped that project will provide a useful guide for choosing the right routing protocol for organisations
- Tool: NS-2
- Routing Protocols to investigate: LSF, DV
- Performance Criteria: Packet Delay, Throughput, Scalability

Project 6 - Comparison of Network Simulation Software

- Aim: Compare different network simulation software using a test scenario

- Goal: Investigte capabilities of different network simulators. Identify weaknesses and strengths
- Simulation Tools to Investigate: NS2, Opnet, OMNET, Qualnet, Packet Tracer, etc
- Case Study: Create a small network and simulate traffic using a routing protocol
- Performance Criteria: Usability, Learning curve, capabilities, advanced futures, available tools (modules)

Project 7 - Investigate Wireless MESH networks

- Aim: Compare different network simulation software using a test scenario
- Goal: Investigte capabilities of different network simulators. Identify weaknesses and strengths
- Simulation Tools to Investigate: NS2, Opnet, OMNET, Qualnet, Packet Tracer, etc
- Case Study: Create a small network and simulate traffic using a routing protocol
- Performance Criteria: Usability, Learning curve, capabilities, advanced futures, available tools (modules)

Project 8 - Practical ad hoc network implementation

- Aim: Create a functioning adhoc network using the equipment available in the labs
- Goal: is to examine performance characteristics when different IEEE 802.11 standards are used
- Environment: specialised networking labs
- Test Method: develop scenarios and actual network setups using the network equipment available to the students and measure performance

Project 9 - Compare Network Management software

- Aim: Compare different network management software using a test scenario
- Goal: Investigate capabilities of different network management software. Identify weaknesses and strengths.
- Network Management software to Investigate: defined after literature survey
- Case Study: Create a small network and monitor using network management software (i.e. Using specialised network labs)
- Performance Criteria: Usability, Learning curve, capabilities, advanced futures, available tools (modules)

Project 10 - Investigate effect of different queing mechanisms on Routing for different Traffic Models

- Aim: Investigate performance of routing protocols for different traffic models and network topologies. (Focus here is not on the routing protocols but on the queing)
- Goal: It is hoped that project will provide a useful guide for choosing the right routing protocol for organisations
- Tool: NS-2

Project 11 - Simulation Package or Real Time Simulation or Virtualised Network?

- Aim: Compare simulation results with real life router implementation and virtual network
- Goal: Identify strengths and weaknesses of using simulation packages, how close can they get?
- Simulation Tool: OPNET Modeller or NS2 or OMNET++ or QualNet
- Virtualised OS: Windows 2003/2008 or Linux
- Router: Configure Router within Packet Tracer
- Routing Protocols to investigate: OSPF or RIP

Project 12 - MANET Routing Protocols - Survey

- Aim: Investigate Manet Routing Protocols
- Goal: Produce a very detailed comparison of the existing approaches for solving routing problem for Manets
- Issues: No simulation or practical implementation is required. However, each approach will be investigated in very detailed manner. It is expected that classification of

approaches produced as well as comparison based on the criteria defined within the thesis.

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