Graduation Project Ideas

Proposed By

Faculty Members

Department of Communication and Networks

Updated 7/12/2013

Faculty Member	Proposed Project Title	Research Interests
Dr. Abdullah M. Almuhaideb Email: aalmuhaidob@kfu.edu.sa Ext:9215 or 8121	1. Design and Implementation of a Mobile Authentication System to resist Denial of Service Attacks	▪ Mobile Security & Performance ▪ Ubiquitous Computing ▪ Mobile Software Agent
	2. Design a Selective Security Architecture and its implementation over SSL	
Dr.Tayseer AL-khdour Email: talkhdour@kfu.edu.sa Ext: 8116	3. Water flooding detection using RFID and WSN	▪ Wireless Sensor Networks. ▪ Wireless Networks. ▪ Optimization.
	4. Performance Evaluation of the KFU network using Opnet.	
Mr. Asad Tariq Email: atariq@kfu.edu.sa Ext: 9242	5. Patient Monitoring System with Sensors	▪ LTE, 4G ▪ Wireless Networks, Satellite & Broadcasting Networks. ▪ Network Automation ▪ Wireless Network Security.
Mr. Ahmed Al Guqhiman Email: aalguqhaiman@kfu.edu.sa	6. IPv6 Networks	▪ Network Security ▪ Pen Testing ▪ IPv6 Networks
Dr. Mohammad Al Zahrani Email: malzahrani@kfu.edu.sa		• Networking Applications • Mobile Computing. • Wireless Sensors Networks.
Prof. Muhammad M. Yasin Email: mmyasin@kfu.edu.sa Ext: 8128		▪ Wireless Ad-Hoc Networks ▪ Network Security
Dr. Ishtiaq Chouhdry Email: ichoudhry@kfu.edu.sa Ext: 8131		▪ Computer Network Protocols. ▪ Network Security. ▪ Operating Systems and Embedded Systems.
Dr. Saqib Rasool Chaudhry Email: schaudhry@kfu.edu.sa		
Mr. Mohammad Alghawanem Email: Mmstghow@kfu.edu.sa Ext: 8148		▪ Wireless Sensor Networks. ▪ Network Performance Analysis.
Eng. Rahoof P P Email: rahoof@kfu.edu.sa Ext: 8136		▪ Network Security ▪ Network protocols ▪ Cloud Computing

Project Title	**Design and Implementation of a Mobile Authentication System to resist Denial of Service Attacks**
Proposed By	Dr.Abdullah M. Almuhaideb
Brief Description	In Denial of Service (DoS) attacks against roaming services, the adversary may flood a large number of illegal access request messages to network servers (both home network and foreign networks). The purpose is to exhaust their resources and render them less capable of serving legitimate users. Obviously, a practical authentication mechanism should maintain service availability despite of DoS attacks.
Expected Outcomes	Design an authentication protocol to address the Denial-of-service attacks issue in the mobile environment; Comparative analysis of existing design solutions; proof of concept by simulation using OPNET and by implementing the protocol.
Available Resources	OPNET
Required Resources	None
Skills Required	Working with OPNET, Programming
Specialized Tutoring/Help to Be Provided by the Supervisor	Tutorial will be provided about this specialized topic to the Group.

Project Title	**Design selective security architecture and its implementation over SSL**
Proposed By	Dr.Abdullah M. Almuhaideb
Brief Description	The inherent limitations of mobile devices (MD) increase the gap between security and performance, and this gap increases with the growing heterogeneity of computing environments. The aim of this project is to design a selective security architecture which can be integrated into security protocols to provide an efficient and secure mobile communication. The architecture makes use of both the information sensitivity and MD capabilities performance levels classifications in making a decision for suitable algorithm key length. As a possible application, the implementation will integrate the proposed architecture over SSL protocol to demonstrate the flexibility features that improves the protocol security performance.
Expected Outcomes	Applications are provided with an interface for selectively securing information at different levels of protection.
Available Resources	OPNET
Required Resources	None
Skills Required	Working with OPNET, Programming
Specialized Tutoring/Help to Be Provided by the Supervisor	Tutorial will be provided about this specialized topic to the Group.

Project Title	**Water flooding detection using RFID and WSN**
Proposed By:	Dr.Tayseer AL-khdour
Brief Description	Developing a system to detect water flooding and send an alarm when it is needed. The WSN network and RFID technology will be coupled to build the system . The students will use RFID tags, RFID readers, and wireless sensor motes to build a the system. the optimal deployment of the tags, and readers will be identified. Accordingly, the prototype system will be built physically. The programs that are needed to control the operation of the system will be developed.
Expected Outcomes	WSN and RFID system that detect water flooding and send alarm when needed will be built, the system will include hardware and software components.
Available Resources	
Required Resources	RFID tags RFID readers Wireless Sensor motes
Skills Required	Programming Experience to deal with hardware components.
Specialized Tutoring/Help to be provided by the Supervisor	

Project Title	**Performance Evaluation of the KFU network using Opnet.**
Proposed By:	Dr.Tayseer AL-khdour
Brief Description	The KFU network will be studied in details. The topology of the network, the components of it such as switches, bridges and links will be identified. Accordingly, an Opnet model will be built to simulate the KFU network. Performance evaluation of the model will be performed assuming different scenarios. Based on the results analysis, Recommendations to improve the KFU network will be proposed.
Expected Outcomes	An Opnet model that represents the KFU network will be built. Performance evaluation of KFU network assuming different scenarios will be performed.
Available Resources	Opnet Simulation tool
Required Resources	
Skills Required	Programming
Specialized Tutoring/Help to be provided by the Supervisor	

Project Title	**Patient Monitoring System with Sensors**
Proposed By:	Mr. Asad Tariq
Brief Description	We can work on the idea of monitoring of paralyzed and Comma patients and let hospital staff inform about it. We can put sensors on the patient's body to gather the data of patient's movement, temperature, blood pressure etc. which will useful for doctors to analyze the patient or tackle any emergency situation.
Expected Outcomes	Students will be able to apply real time applications to medical industry.
Available Resources	IEEE
Required Resources	Sensor Lab.
Skills Required	Sensor Networks, Network Simulation.
Specialized Tutoring/Help to be provided by the Supervisor	

Project Title	**IPv6 Networks**
Proposed By:	Ahmed Al Guqhiman
Brief Description	As IPv4 has been used for many years and the ISPs are running out of the IP addresses, new and current organizations will have to use the IPv6 networks. So, in this project students have to design and develop the IPv6 networks for medium organizations and deploy IPv6 networks for current organizations that have IPv4 running.
Expected Outcomes	Comparing the IPv4 and IPv6 networks Network infrastructure (WAN and LAN) Network services in IPv6 (email, DNS, etc) IPv6 addressing Routing protocols Security infrastructure Deployment and transition
Available Resources	Developing IPv6 Networks, Criprian Popoviciu, Eric Levy-Abegnoli, Pattric Grossetete TCP/IP Protocol Suite, Behorouz A. Foruzan Internet
Required Resources	Developing IPv6 Networks by Criprian Popoviciu, Eric Levy-Abegnoli, Pattric Grossetete
Skills Required	Knowing what the IPv6 is and how it functions Knowing the TCP/IP very well How to secure networks
Specialized Tutoring/Help to be provided by the Supervisor	