Scientific Computing Department

Suggestions for Graduation Projects (2014\2015)

No.	Supervisors	Project Name
1	Dr. Howida Shedeed Dr. Manal Tantawi	**Using P300 Brain Signal For Brain Speller** P300 spellers are mainly composed of an interface by which alphanumerical characters are presented to users and a classification system which identifies the target character by using acquired brain signals (EEG).
2	Dr. Howida Shedeed Dr. Manal Tantawi	**BNCI : Brain Neural Computer interface System for Wheelchair Control** Brain computer interfaces (BCI) offer the possibility to overcome the barrier of physical interaction when controlling a powered wheelchair, which could be vital in providing independent mobility to the severely disabled people. The system captures different brain signals and controls the wheelchair without any relying on the peripheral nerves or muscles.
3	Dr. Howida Shedeed Dr. Manal Tantawi	**Neurophone: Using Brain Signal for Controlling Smart Phones** Using brain signals to control mobile phones for hand-free, silent and effortless human-mobile interaction. Such application helps people with severe disabilities to use mobile and also helps healthy people while driving.
4	Dr. Hala Moushir	**Virtual objects for Previewing 3-D Décor Changes on a phone captured image.** Previewing 3-D objects on a phone captured image can be useful for interior designers, marketing for furniture companies. Change the wall color in a captured scene could add feature to the app for 3-D Décor change preview.
5	Dr. Hala Moushir	**Vision-based system for the prevention of car collisions at night**
6	Dr. Hala Moushir	**Analysis of Basketball or Football game**
7	Dr. Safaa Amin	**Managing Graph Representing Networks In A Distributed Manner** In recent years, Advancements in technology have enabled access to huge amounts of information about various complex networks including social networks, transportation networks, communication networks, citation networks and the World Wide Web. These networks introduce the following requirements: * Low latency: As applications are interactive, they require low query execution time. * Scalability: The employed graphs may not fit on a single server, motivating a distributed system design.
8	Dr. Safaa Amin	**Motion planning of Swarm of nano-robots in human body** The past decade has witnessed new robotic technologies in real

		world applications, particularly in nano-medicine. Nano-medicine is a promising and revolutionary technology especially in diagnostic and therapeutic field. Therefore, there is a growing demand to apply advanced nano-robotic techniques in nano-medicine applications. In this project, new cooperative motion planning strategies are proposed for a swarm nano-robot system in human body environment
9	Dr. Safaa Amin	**DNA based steganography** Information the most useful and used thing in any place at any time. Also, the information capacity is growing day by day, it's importance as well as its transformation. Nowadays, Cryptography and Steganography are considered the most famous and secured techniques in the security field. The research in these fields becomes so enthusiastic in order to provide effective, safe and secured communication from the third parties which are attackers and hackers. Cryptography is the art of converting the secret information from its original form into unintelligible text [2] while steganography is the art of data hiding in a cover media, e.g. , image, video or audio [3]. Nowadays, Deoxyribonucleic acid (DNA) is considered one of the new effective and powerful carrier that can be used in the Steganography process. DNA has a lot of properties that can be exploited for achieving ideal secured communication. This project aims to proposes DNA based steganography algorithms that exploit the DNA in enabling safe transfer for the critical data over the unsecure network
10	Dr. Mohammed Abdel-Megeed Salem	**3D Segmentation for Coronary Artery Disease (CAD) Images** 3D segmentation of coronary artery provides important assessment of the luminal area of the coronary artery, thus the local amount of stenoses which is one of the most important parameters to determine the degree of CAD. Thus, developing accurate, reliable, and robust segmentation method for 3D medical images is the problem addressed by this proposed project. - Programming Skills (C++, C#, or Matlab) - Pattern Recognition - Image Processing
11	Dr. Mohammed Abdel-Megeed Salem	**Journalistic Video Editing and Visualization Tool** Content-based search and retrieval of journalistic video data has become a challenging and important issue. Although these type of videos are short in duration bit they contain several types of audio and visual information which are difficult to extract, combine or trade-off in common video information retrieval. - Programming Skills (C++, C#, or Matlab) - Database - Video Processing - Pattern Recognition - Web and Mobile based GUI design and implementation
12	Dr. Mohammed Abdel-Megeed Salem	**Assistive Navigation for Visually Impaired based on Mobile Computing (Tablet PC).**

		(Field: Computer Vision, Graphics, Pattern Recognition). - Programming Skills (C++, C#, or Matlab) - Pattern Recognition - Mobile Computing
13	Dr. Mohammed Abdel-Megeed Salem	**Personal Photo Retrieval.** (Field: Image Processing, Pattern Recognition) - Programming Skills (C++, C#, or Matlab) - Pattern Recognition - Image Processing
14	Dr. Mohammed Abdel-Megeed Salem	**Mobile-based License Plate Recognition and Parking Management** - Programming Skills (C++, C#, or Matlab) - Pattern Recognition - Image Processing
15	Dr. Ahmed Ali Dr. Ahmed Samir	**Big Data Platform** Heavy use of computing is producing a large amount of valuable data every day. There have been advances (e.g. Map Reduce) at the infrastructure level for processing large amount of data. However, the challenges remains at the upper layer on connecting business data silos, accommodating entrenched but efficient domain-specific analysis tools, making analysis results usable in real-time to business operations, all in end-user friendly ways. The aim of this project is to connect a set of existing open-source tools through programmable web-interfaces to tackle the above challenges. NICTA's Software Systems Research Group (SSRG) has developed a web-based tool mash up technology to make this task easier. Work in this project would include understanding big data tools and NICTA's mash up tool, writing web-layer wrappers and programmable interfaces for existing tools and build a demonstration system. The key novelty is its ability to advertise the capabilities of existing tools and connect them through the basic Web. The outcome would be a proof of concept and demonstration system for web-coordinated analysis tools and data sources. This project is suitable for individual or group. **References:** Liming Zhu, Len Bass and Xiwei Xu, Data management requirements for a knowledge discovery platform, Architectures and Platforms for Knowledge Discovery from Data, Helsinki, Finland, pp. 4, August, 2012.
16	Dr. Ahmed Ali Dr. Ahmed Samir	**Availability Analysis for Applications in Public Cloud** The cloud is a disruptive technology and is quickly being adopted. Putting applications in the cloud will introduce uncertainties for operations that have traditionally been under the direct control of an enterprise. Enterprises will be dependent on cloud providers and will need to use indirect means to understand and guarantee their quality goals such as performance and availability. In this project, you will get exposures to Amazon's public cloud services and working with system engineers from Yuruware on

		their real world products and problems regarding achieving high availability through analysing deployment architectures and performing measurement. This project is suitable for individual or group. **References:** http://www.ssrg.nicta.com.au/projects/cloud/managing-qos.pml, http://www.yuruware.com/
17	Dr. Ahmed Ali Dr. Ahmed Samir	**Collecting Cloud Environment Errors and Distribution: Case study of AWS/VMware** Designing and deploying an application in Cloud platforms (e.g. Amazon AWS, Rackspace...) is not easy especially dealing with failures and recovery due to the uncertainty of Cloud infrastructure. Understanding and modelling of uncertain cloud infrastructure heavily rely on investigating the documentation provided by Cloud provider and experiment. This project will provide students an opportunity to learn the hot Cloud platforms and technologies and working with system engineers from Yuruware
18	Dr. Ahmed Samir Dr. Ahmed Ali	**Arabic Sign Language Translator**
19	Dr. Ahmed Samir Dr. Ahmed Ali	**Video database search by Action Query**
20	Dr. Ahmed Samir Dr. Ahmed Ali	**Epidemic Spread modeling, Visualization and Prediction**