Arab Academy for Science, Technology and Maritime Transport

College of Computing and Information Technology

Computer Science Department

PROJECT PROPOSAL FORM

Proposer Name : Dr. Manal Helal
Tel: ( ) for now, mhelal@cse.unsw.edu.au
Position:

Proposed project title: Cloud Computing for Web-services & Parallel Processing

Proposed project objectives:

Consider any web services project of choice and running it on any available cloud such as the AWS EC2, and compare performance and cost with other stand along or networked clusters of servers. This can be a web application hosted on normal web servers, and/or any parallel program comparing the performance on multi-core hardware, clusters of networked computers, and the EC2.

1. Measuring Webhosting, file-sharing, database availability, performance and cost on the different architectures.
2. Parallel processing performance and cost comparison on the different architectures.
3. Writing comparison report about positives and negatives of the different architectures, and suitability for the different applications.

Proposed methodology:
Web development skills, parallel programming skills,

Academic Pre-requisites (if any): Web Technologies, Data structures and Algorithms, Database development, parallel processing, basic networking knowledge.

Co-operating Organization (if any):

Special Requirements (if any):

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PROJECT PROPOSAL FORM

Proposer Name : Dr. Manal Helal
Tel: ( ) mhelal@cse.unsw.edu.au
Position:

Proposed project title: GPU vs CPU performance evaluation.

Proposed project objectives:
Develop an image or video processing application like feature extraction, pattern recognition, or any graphics text book problem and implement it using CUDA toolkit on a GPU, and report the normal CPU performance compared to the GPU.

1. Learn CUDA GPU development toolkit.
2. Compare GPU vs CPU performance
3. Compare GPU vs other parallel architectures, like multi-core, clusters of computers, or any accessible High Performance Computers.

Proposed methodology: Image and Video Processing Algorithms as documented in text books, or downloaded from recent open source applications, Redevelop for GPU using CUDA toolkit, Performance and Complexity measures and comparisons.

Academic Pre-requisites (if any): image and video processing, data structures and algorithms, parallel processing

Co-operating Organization (if any):

Special Requirements (if any):

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PROJECT PROPOSAL FORM

Proposer Name : Dr. Manal Helal
Tel: ( ), mhelal@cse.unsw.edu.au
Position:

Proposed project title : High Dimensional Data Analysis

Proposed project objectives:
Experimenting with any high dimensional dataset such as those from UCI (University of California, Irvine) datasets from the machine learning repository by the Centre for Machine Learning and Intelligent Systems, and apply various Multivariate Statistical methods from R or matlab, compare and report results.

Proposed methodology: Numerical Analysis, Linear programming, Artificial Intelligence Methods such as Principal Component Analysis (PCA), Independent Component Analysis (ICA), Neural Networks, and Support Vector Machines, Clustering & Classification methods,

Academic Pre-requisites (if any): Artificial Intelligence Basics, Data Structures and Algorithms, Programming

Co-operating Organization (if any):

Special Requirements (if any):

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PROJECT PROPOSAL FORM
Proposer Name: Dr. Manal Helal Tel: ( ) for now, mhelal@cse.unsw.edu.au Position:
Proposed project title: Understanding Crowed Serviced Web Contents
Proposed project objectives: Use web crawlers to download data available in the internet public domain, and apply natural language processing and learning techniques to extract information of interest to specific or general queries.
Proposed methodology: Natural Language Processing, Web technologies, Artificial Intelligence Machine Learning techniques and Knowledge Discovery.
Academic Pre-requisites (if any): Artificial Intelligence, Programming (Web Technologies – Google API, Facebook and Twitter … etc- and Python language skills or willingness to learn),
Co-operating Organization (if any):
Special Requirements (if any):

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PROJECT PROPOSAL FORM

Proposer Name: Dr. Manal Helal
Tel:( ) mhelal@cse.unsw.edu.au
Position:

Proposed project title: Automatics Traffic & Crowed Management

Proposed project objectives:
Build a traffic and crowds management system, using information collected from cell phone access points, street cameras, radar cameras, satellite images, online location tagged posts on twitter, facebook, or blogs, or any accessible information source, to estimate the number of people in a given location at a given time, and the exits and entries routes to that location. Features like safe entries and exits need to be estimated, emergency situation detection and intervention methods, controlling crowds and leading them out of hazards scenarios.

Proposed methodology: This will apply a number of technologies and computing methods, for example, genetic programming, optimization, shortest path algorithms like Dijkstra, or neural networks, or as research and experimentation leads.

Academic Pre-requisites (if any): Data Structure and Algorithms, Artificial Intelligence, Web Technologies, Programming

Co-operating Organization (if any): Will require approvals and information from phone companies, traffic authorities, and satellite and radar images authorities, to provide sample data to experiment with, and hopefully continuous live-data feed protocols cam be established.

Special Requirements (if any):

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PROJECT PROPOSAL FORM

Proposer Name: Dr. Mostafa Elsayed, Dr. Mohamed Bakr

Proposed project title :

Achieving security through biometric system

Proposed project objectives:

In addition to its extensive use in forensic sciences, biometrics technology is rapidly being adopted in a wide variety of security applications such as electronic and physical access control, electronic commerce, digital rights management, homeland security, and defense. Security systems demand high accuracy, high throughput, and low cost. There is continued need for vigorous research to solve many outstanding challenging problems. Students will benefit a lot from performing research in this area using a database of fingerprints, iris, etc.

Proposed methodology :

Academic Pre-requisites (if any):

Using Matlab will be important but programming in another high level language (C++, C# or Java) will be a plus. No assumption about pre-knowledge in pattern recognition or image processing is made. The research groups of students who choose one of these topics are expected to handle suggested readings for understanding the background about pattern recognition and image processing.

Co-operating Organization (if any):

Special Requirements (if any):

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PROJECT PROPOSAL FORM

Proposer Name: Prof. Dr. Hassan Saleh, Dr. Mohamed Bakr

Proposed project title :

EA-based Image Watermarking

Proposed project objectives:

Watermarking techniques involve the concealment of information within a text or images and transmit this information to the receiver with minimum distortion. This is an attractive area of research. These techniques will have a significant effect on defense, business, copyright protection and other fields where information needs to be preserved at all cost from attackers. A typical application of digital watermarking is to identify the ownership of a multimedia object or content by embedding the owner mark, or the watermark, into it. Most multimedia applications require imperceptible and robust watermarks.

The purpose of this project is to propose and implement an image watermarking technique based on one of the widely used **Evolutionary Algorithms** (EA) optimization techniques.

Proposed methodology :

The students group will study several representative concepts in image watermarking. In addition, students will cover the attacks that tamper watermarks and the theoretical aspects of watermarking with some benchmarks in order to evaluate the proposed watermarking technique.

The students, after going through this project, will learn the fundamentals of watermarking and its current status, and will be ready to explore the recent optimization techniques.

Academic Pre-requisites (if any):

Good knowledge of C or C++ and Matlab

Co-operating Organization (if any):

Special Requirements (if any):

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PROJECT PROPOSAL FORM
Proposer Name: Dr. Samah Senbel E-mail: senbel@aast.edu
Proposed project title: Automated Traffic Ticketing System
Proposed project objectives: An Automated system that consists of a group of cameras installed at traffic intersections to detect & photograph red-light traffic violations & detect the license plate number of the car & immediately access the database & record the violation as well as send a message to the violator. The system should also provide a website for traffic monitoring by the authorities.
Proposed methodology:
Academic Pre-requisites (if any):
Co-operating Organization (if any):
Special Requirements (if any):