Dr. Syed Muhammad Anwar

1- Online Fashion Image Retrieval

The project will focus on using a mobile phone application to capture an image. The image will be used as a source to segment out various fashion apparels (shirts, prints, accessories etc). The segmented parts will be used to retrieve images from an online/offline database with a particular focus on online shopping.

2- Fashion store Image tagging

The project will develop an application to automatically tag items available at a Fashion retail outlet. The purpose of this tagging is to store images on the online store for better image retrieval.

3- EEG/ECG based personal trainer

An android as well as web application will be developed to aid in personal training for a healthy lifestyle. Various parameters that can be recorded using wearable sensors will be used. The data will be analysed and displayed in a user friendly manner. The major aim will be to suggest methods for better lifestyle learned from the day to day activities.

4- A personal assistant for context aware car

The project will focus on developing a personal car assistant (a phone app and a webpage). The data will be collected using various sensors placed in the car. The collected data will be analysed and displayed so that to assist the user in day to day activities. The aim would be to make the user more aware of maintaining the car and also use current day communications capabilities to make the car more secure.

5 – Time Out: A travel companion

A web and mobile based app that will help in local travel planning, identifying locations, best deals for hotels and attractions.

Engr. Mubbashir Ayub

1. **Programming by voice.** Software development using programming language requires keyboard for input. But programming using keyboard typing takes too much time. Also there are typing errors which are identified at compile time. For disabled persons programming using keyboard is also impossible. Therefore a speech based programming tool for development in programming languages (C++) should be developed.

2. **Accounts Diary Dispatch System**

Keeping track of files is an important action in an organization. When a student/ employee contacts accounts office for his application/ bill. Staff at that office starts searching in a

register which is a time consuming process. This application will act as a diary dispatch system through which tracking of any file should be very easy.

3. **Automated Clearance System**

Final year students will have to wander so many offices for their clearance. Also there is no proper record in any office that which student has got clearance and which student not. Through this application all offices will submit their record to the person handling this application. Final year students will contact this person. This application will show the history of student regarding non-payment of Fees, hostel mess, any fine, item issued from any store e.t.c.

Also this system will automate the clearance process of university employees.

4. **A classification algorithm for classification of different types of images.**

This algorithm will classify images based on their similar feature such as colors and objects.

5. **An application for measuring user closeness in social networking sites:** Using graph theory and interaction behavior between users in an online social networking website an application should be developed to give rank of friends in users' social circle to measure users' closeness.

6. **Hostel allotment system:** Due to the increase in students and no of hostels now there is a need for automated allotment of students. A web application in which students will apply online for allotment and they will be allotted automatically.

7. **A recommender system for e-commerce websites:**

8. **TREC:** TREC will be an application that will incorporate trust in recommender systems. Current recommender systems didn't consider trust. Trust is an integral part of human lives. Persons trust each other and rely on recommendations of their friends for shopping, teaching, study, tours and meal purpose. TREC will incorporate trust in recommender systems algorithms which current recommenders systems neglect.

Dr Hussain Dawood

1. **A noise-ranking switching filter for images with general fixed-value impulse noises**

Impulse noise is generally classified into random-value and fixed-value types. However, most of the previous literatures recognized salt and pepper (S&P) noise as the fixed-value impulse noise because it is easily detected and recovered. In this research project, a general fixed-value impulse noise model will be considered, in which the corrupted pixels will be set to not only the minimum– maximum values but also any fixed intensities. In order to clearly distinguish the noise-free pixels from noisy pixels having the same gray value, the identification stage of noise-ranking switching filter (NRSF) will be consists of three methodologies, named global–local statistics analysis, sectional boundary discriminative noise detection, and a directional

test. Once a corrupted pixel has been identified, the same matrix convolution technique used in the last test is employed again in the second NRSF stage to remove the noise.

2. **Blind Image De-blurring Using Spectral Properties of Convolution Operators**

Blind de-convolution is to recover a sharp version of a given blurry image or signal when the blur kernel is unknown. Because this problem is ill-conditioned in nature, effectual criteria pertaining to both the sharp image and blur kernel are required to constrain the space of candidate solutions. While the problem has been extensively studied for long, it is still unclear how to regularize the blur kernel in an elegant, effective fashion. In this research project, we will show that the blurry image itself actually encodes rich information about the blur kernel, and such information can indeed be found by exploring and utilizing a well-known phenomenon, that is, sharp images are often high pass, whereas blurry images are usually low pass. More precisely, we will try to show that the blur kernel can be retrieved through analyzing and comparing how the spectrum of an image as a convolution operator changes before and after blurring.

3. **Local statistics based impulse noise image de-noising**

Images get corrupted during the acquisition, transformation, compression with different types of noise, such as, Gaussian noise impulse noise, gamma noise etc. In this research project, we are concerned about the identification and removal of an impulse noise by utilizing the texton concept at the local sliding window. A framework for the identification and removal of an impulse noise will be implemented in the MATLAB. Also a brief comparative study will be conducted among the state-of-the-art impulse noise image de-noising methods.

Dr. Hassan Dawood

1. **Local Orientation Adaptive Descriptor**

Visual image classification is a challenging problem in computer vision, especially un- der multiple sources of image transformations, e.g. rotation, illumination, affine and scale variations. Local Orientation Adaptive Descriptor (LOAD) has two important advantages. (i) Strong regional texture discrimination and robustness to image rotation and illumination variation. The main goal of this research is to implement LOAD on MATLAB project LOAD will be implemented and modifications will be done for texture classification.

2. **Interest point based features**

Feature description for local image patch is widely used in computer vision. While the conventional way to design local descriptor is based on expert experience and knowledge, learning-based methods for designing local descriptor become more and more popular because of their good performance and data-driven property. The goal of this research work is to give an overview of data-driven method for designing binary feature descriptor, which

we call receptive fields descriptor (RFD) and will be tested on complex structures of an image.

3. Texture image classification using Local Binary patterns

Image texture classification plays an important role in the field of computer vision and pattern recognition. Designing effective features is a fundamental problem in many computer vision tasks, including image retrieval, object and scene recognition, texture classification, etc. However, in many real applications, there always exists large intra-class variation due to different 3D poses and different object appearance. It has been proved that co-occurrence of features could boost the discriminative power of features. In this project, pairwise rotation invariant co-occurrence local binary pattern will be implemented and will be tested on different texture image datasets.

Engr. Kanwal Yousaf

1. Virtual Learner 2.0 (Android Application)

From study it is proved that software engineering methodologies can be used to enhance e-Learning and by implementing Web 2.0 techniques can also foster a more powerful and collaborative additional e-Learning tool. Virtual Learner 2.0 provides a platform where all students can collaborate about latest educational contents via smart phones.

2. Web 3.0 based intelligent Engineering Course Book Recommender Application

Web 3.0 will be the next logical step in the evolution of the Internet. For Web 1.0 and 2.0, the Internet is trapped within the physical walls of the computer, but as more devices become connected to the Web, such as smart phones, cars, and other household appliances, the Internet will be set free and become omnipresent. The Internet will be able to perform tasks faster and more efficiently, such as search engines being able to search for the actual individual users interests, and not just for the keyword typed into search engines. This Web 3.0 based intelligent application will provide its users to refine all of his/her interest related engineering books.

3. A Personalized Mobile Search Engine (PMSE)

This project is different from the conventional search engines as it provides the ease of searching based on user preferences. The user preferences are classified as content concepts and location concepts. The project involves arrangement of user preferences in ontology-based multifaceted user profile for rank adaption purpose.

4. Time Table Manager (Android Application)

This application will provide any person to organize his/her daily, weekly or monthly plans accordingly. User can set his/her notification manager to update him regarding any new event etc.

Engr. Huma Ayub

1. **Ontology base image retrieval system**

CBIR Content Based Image Retrieval system is used for Image searching based on their similar contents. That searching is carried out based on the three features on an image that are Texture, Shape and color. Individual work has being done on these features. This project OBIR that is Ontology Based Image Retrieval does the same work using the hybrid technique of the image's features and the use of ontology will enhance the Storage arrangement of features. The same type of features will get extracted from the input query image and then will get matched by the features in ontology.

2. **Capturing Happy emotion from an image**

3. **Capturing Sad emotion clips from video**

4. **Interactive Donation Management System:**

Interactive Donation Management System will enable us to minimize the hunger and poverty from this world, to achieve this goal we are taking fund raising process to gross root level, so that every common man can donate anything. There are many movements, NGOS and some Government agencies that trying their best to decrease hunger and poverty from this world globally as well as locally. Our System will provide such organizations an efficient management of their resources and create trusty relationships between Donors and NGOS.

5. **Smart Eye:**

The concern of this project is to develop a digital signage system that determines the gender, generation and other attributes of a person standing in front of a display and outputs advertisements on the display according to them. The system first look at the people available at the front of the billboards then finds their attributes i.e gender, age. After finding the attributes of maximum possible persons it will categories them according to their attributes. As this system already contains the sorted advertisements according to different attributes it will take the best suitable advertisements and display it to attract the people. This system will also measure advertising effect, focusing on whether the people who saw the advertisement showed interest or whether the advertisement stimulated the viewers' purchase activity. By using this factor companies can change their offers according to the interest of people that is recorded by this system. So, this system will let the companies to market their products and offers in the right direction.

6. **Image+**

Image+ is an image processing toolkit which provides the solution to the basic problems of image editing. It provides several types of image processing functionalities that are mostly required at a single platform. The basic features of this software are segmentation, content

based authentication through watermarking, enhancement, compression, registration and fusion. All these functionalities are provided by usage of new, efficient and reliable method.