**PROJECTS**

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***It is up to the group to choose any programming environment to build their software. Project client will be assigned for each group once the group is finalised.***

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**Detecting Data Leaks in Android applications** (**Group Size 4**)

Consider a data sender who transfers some confidential data to some of his counterparts (third party). Some of this sensitive data gets leaked accidentally or purposely by an attacker and is downloaded on his terminal. The distributor must find the possibilities that the compromised data was from one or more of his counterparts, as opposed to having gathered by other means. So our project allows for data allocation tactics (through the counterparts) that improves the chances of identifying data leakages. These methods do not depend on various alterations of the transferred data like parity.

**Intelligent routing for smart skips (Group Size 4)**

Smart skips are fitted with sensors that send signals to the app whether it is full or not. (Skips are the rubbish bins collect by city councils usually from constructions and commercial sites.).

The students need to develop an android app using dummy database. The expectations are:

1. The application must notify the user when the skip is full.
2. Route mapping for skips. The skips could have different destinations. For example: the skip with concrete might go to the concrete crushers and the skip with mixed waste to the landfill.
3. Alert landfill operators about the skip load.
4. The app must provide the shortest route from source to destinations. There can be multiple destinations.
5. The app need to be integrated with google maps

**Student attendance using facial recognition (Group Size 3)**

The students’ needs to develop a web based student attendance system using facial recognition. You can create your own data set for facial storage and you need to integrate a webcam for taking photographs. You have to use very light and Artificial Intelligence based algorithm for facial recognition. It could be reported in excel sheet the list of absent/present.

**Mobile Attendance System Project (Group Size 3)**

The mobile attendance system has been built to eliminate the time and effort wasted in taking attendances in schools and colleges. It also greatly reduces the amount of paper resources needed in attendance data management. The system is divided into following modules:

* **This is an android mobile app**. It’s built to be used for school/college faculty so that they may take student attendance on their phones.
* **Student Attendance List Creation:** Once this App is installed on a phone, a it allows user to create a student attendance sheet consisting of name, roll number, date, Absent/Present mark and subject. He has to fill student names along with associated roll numbers.
* **Attendance Marking:** The faculty has the list on his phone now. He may see the list call roll numbers and select absent id the student is absent or select present if student is present.
* **Attendance Storage:** This data is now stored in the faculty mobile phone. Faculty may also view it anytime on their phone.
* **Attendance sheet transfer:** The faculty can transfer the file to a server (normal computer) via an internet connection where this data can be stored and maintained by the school or college.
* **Attendance Check:** The PC operator may now check the attendance transferred as Student roll no, date, time and sort by date to check presentees and absentees of a particular date.

Thus this system automates attendance system and eliminates the use of paperwork needed for attendance marking and monitoring student attendance.

**Android Based Parking Booking System (Group Size 3/4)**

The proposed project is a smart parking booking system that provides customers an easy way of reserving a parking space online. It overcomes the problem of finding a parking space in commercial areas that unnecessary consumes time. Hence this project offers a web based reservation system where users can view various parking areas and select the space to view whether space is available or not. If the booking space is available then he can book it for specific time slot. The booked space will be marked yellow and will not be available for anyone else for the specified time. For demonstration we will be using 4 parking spaces and each parking space will have 20 time slots. This system provides an additional feature of cancelling the bookings. User can cancel their books space anytime. Users can even make payment online via credit card. After making payment users are notified about the booking via email along with unique parking number. The client app allows parking booking on android phone. The server side web service is stored on a web service.

**Forensic Applications of Bar Codes (Group Size 4)**

Bar code readers are used in various applications ranging from supermarket checkouts to medical devices. Bar codes are also incorporated into exhibit labels and evidence bags. Forensic applications of bar codes include `decoding’ of damaged or partial bar codes on parts of suspected stolen vehicles. Work done by Barrett and Smith (Science & Justice Vol No.3 2005) showed that it was possible to restore an altered barcode to its original state. This project will examine techniques to restore partial barcodes and develop a test to ensure results obtained are valid.

**DDos forensics using MapReduce (Group Size 3/4)**

A Distributed Denial of Service (DDoS) attack aims at making a system unavailable by flooding the target with a large number of requests. During these attacks, the volume of the produced log files grows rapidly. A forensic investigator will take a long time to analyse these files to find the source of the attack for containment and to re-establish system availability. This project investigates the use of Hadoop and MapReduce to detect packets that belong to a DDoS attack, which would otherwise require a long time to be achieved.

**Credit card fraud detection system (Group Size 4)**

The credit card fraud detection features use user behaviour and location scanning to check for unusual patterns. These patterns include user characteristics such as user spending patterns as well as usual user geographic locations to verify his identity. If any unusual pattern is detected, the system requires reverification.

The system analyses user credit card data for various characteristics. These characteristics include user country, usual spending procedures. Based upon previous data of that user the system recognizes unusual patterns in the payment procedure. So now the system may require the user to login again or even block the user for more than 3 invalid attempts

**Sharing a ride among city dwellers (Group Size 4)**

Taxi is expensive and too much vehicles with just one person in it is also not very conducive for the traffic and environment. An app may help out by matching the potential destinations of two or more visitors to the same place after both parties have agreed to declare their destination to the central server where matching is done automatically, making sharing a single vehicle possible. The person who is taking the lift may contribute in gas cost or other forms of financial contribution which will be much less than that of using taxis and also saves time for waiting for a bus. This may help young students or people who might have their cars not available for some reason at that time.

**CCTV Video Analytics (Group Size 4)**

The overall capability to automatically analyse video images to extract objects, detect events, and to perform behavioural analysis, is referred to as video analytics. This field remains one of the most elusive fields to explore but till now the progress has been slow. New algorithms are always needed to fine tune the work that have already been done.

**Howard Springs plant guide (Group Size 3)**

The Top End Native Plant Society and Northern Territory Herbarium have completed a project to produce a field guide for the plants of Darwin sandsheet heath. This includes the sandy seasonally flooded areas near Howard Springs, which supports a diverse range of plants, including some of the threatened plants species of the Northern Territory. It includes 141 plant species, which are divided into herbs, grasses, sedges and woody shrubs/trees.

A guide for identifying dragonflies and damselflies of the Australian Top End was produced recently and publicised by CDU. It contains pictures of the different species of dragonflies and damselflies, along with a brief description and the ability to search by colour. It is anticipated that the guide to the plants of the Darwin sandsheet heath would have similar functionality. One issue to be considered is the limited mobile phone coverage in the Darwin rural area where these habitats occur.

1. **Project Goals**

* Develop a web-based or app-based identification guide based on the photos and text in the pdf Darwin sandsheet heath plant species guide.
* Make the tool searchable by lifeform (dicot herb, grass, sedge or woody plant) or by flower colour.
* Once produced, it would be publicly available on the CDU and Top End Native Plant Society websites