



PROBLEM STATEMENTS FOR SAAC HACK-2018

A. Fraud Risk Management

A01. It's clear digital fraud is becoming more sophisticated and dangerous as Internet dependency and interconnectivity evolves. However, it's important to note that fraudsters have been at play online since information was first shared in that channel. And with more good consumers moving online for everything from loan originations to insurance quotes and tax return filings, those with malicious intent are well positioned to exploit these trends. Therefore, adjusting your risk strategies is critical to account for the influx of online consumer data.

A02. Identity management is a problem across various industries whether financial services, insurance, government, healthcare or e-commerce. The challenge today, is to mitigate fraud risk when accounts are accessed, new loans or policies originated, and/or during benefits application without jeopardizing the customer experience.

A03 Phishing:

Phishing is easy way for scammers to access your information. If you are the user, you get a message asking you to enter your login information, through text (this is called "smishing") or email. You are conned into thinking this is an authentic message from a business you trust. This information is then used to make purchases through the app you revealed your information for. Or it can be used on other apps/websites by counting on the fact that consumers use the same usernames/passwords across multiple apps. So the task is to create a browser extension or a software to detect phishing pages or to notify the privacy of using user information to be shared and also detect that's a trust worthy site or not.

A04 Spamming:

Spamming the user and getting the user information is a easy method to hack users data. All the internet users are the victim of it . So many tech giant are stumbling upon to create a spam filters eg: Gmail , Sometimes the spam filters gets wrong in detecting the correct mail . So Do you have any idea or algorithm to detect spam and help users to get rid off it . If you then try some hands of code and come up with a running code to detect the spam to make user get out of trouble.

A05 Data Breach:

Data breach is the intentional or unintentional release of secure or private/confidential information to an un-trusted environment. we are in the information age and all the things now we see are data . But some of the data were kept hidden or secured to ensure the user privacy. As all data goes online for some usage they are in-secured and can be breached by the hackers Eg : Aadhar details of millions of people got online. So can you develop a software or effective database algorithm which can prevent data breach at some cause. We know that we cannot secure it all cause but we can try to keep them safe at some point of view Can you be the gatekeeper for those data by bringing your awesome work into it?

A06 Piracy

Piracy , the unauthorized use or reproduction of another's work. When the works of others are stolen and used for the profit then what's the reason of others did those work. Feeling guilty may be you and all of them are part of this. We are knowing or unknowingly use the work of others for our purpose and it may lead to problem or some copyrights law suits. What to do with this problem? Can you develop a software to give the user details about work copyright information and avoid them of being using it. The work may be picture or article or software or anything else. I think web crawling help to work with this problem So go ahead and bring up the software we need.

B. Revamping Marketing and Advertising Strategy

B01. Analysis of responses for a particular product that is to be launched using social media

Description: Design a tool that can listen to social media comments (Twitter, Facebook, YouTube etc.) and intelligently associate feedback i.e. Giving public 's views on the product/software, identifying the product' s competitor and analyzing them etc. specific program/software which is going to be launched soon by a company at a specific time.

B02. Create a digital marketing network for sale of agricultural commodities for the benefit of agriculturist and end user.

B03. Digital marketing strategies for effective marketing of Fast-Moving Consumer Goods (FMCG).

C. Fighting Disabilities

C01. Incorporate a feature in the existing fit bit software for sweat detector which is predicting massive cardiac attack.

C02. Design software which predicts how many units of blood needed for an accident victim suffering from severe blood loss.

C03. Design software and incorporate this feature in a lady's wrist watch/bangle which predicts and alerts for their periods/irregular periods/heavy blood loss pertaining to carry the number of sanitary napkins.

C04. Design software for diabetics which are predicting the rate of cardiac arrest/kidney malfunctioning/eye sight issues.

C05. Design software which depicts the percentage of toxic wastes cleaned in the human legs using fish therapy. Software need to display the percentage amount of toxic wastes before and after therapy.

D. Combating Natural Disasters

D01. Multi Hazard visualization as per location selected by Individual

Description: Each and every regions is affected with natural calamities, disasters etc. Region wise repository and visualization is needed such that if a person selects a particular area, he is able to know what kind of disasters, calamities etc. that region is prone to, for helping in selection of a type of house to be built and with the necessary precautions.

D02. Prediction of rain and local weather based on the available 100 years of rainfall data and modeling a farmer support system.

Description:Some intelligent prediction/expectation of the local weather is essential for all agricultural activities. Mostly the farmers do it based on their understanding and observation on nature. An intelligent support system can be attempted with modern analytical tools and using database on the local weather information available. Predictive models can be made in support of the farmers for each localities and make it available on line whenever they are in need.

D03. Mechanism to evaluate harmful radiation levels in working environment on human society and suggest measures to improve conditions.

Description:In our working environments such as home, office, or an industry, we are surrounded by various kinds of electronic equipments which emit various types of radiation. Exposure to these radiations is known to create health problems. There is no policy, protocol or management system available in the country to handle this issue. It will be good to visualize a monitoring system to of measure the level of harmful radiation in any working environment and provide warning and suggestion on safeguard mechanism. A model project in this line will be a good initiative.

D04. Local level carbon sequestrations to mitigate Climate Change.

Description:Sequestering carbon from air is a requirement to mitigate the imminent global climate change. Drive for carbon sequestration in terms of mass planting of appropriate fruit trees and other beneficial trees in villages, decentralized anaerobic production of charcoal from weed trees and plants such as *Prosopis* and *Lantana* can be taken up by the villagers. A digital mechanism can be planned to motivate this process as a mass movement across the country. A proper quantified documentation and recording of these activities into a national data base will

also create a proof for the country to present our case in the international climate change negotiations.

D05. Mechanism to evaluate Human-Wildlife conflicts in forest areas and develop technologies to mitigate the conflict issues.

Description: This is an age-old problem for the life of people living in and around forest areas. In the last two decades there is an increase in human-wildlife conflicts. This is due to increase in human population, decrease in forest cover and in some cases increase in wild animal population as well. Till date there is no mechanism available to evaluate the human-wildlife conflict issues in the state and national levels. Also, to mitigate the issue, no technological solutions are available. Development of sensor-based technology to mitigate human-elephant conflict issue could be one of the suggested problems.

E. Smart Cities:

E01. Intelligent Traffic Information System

Description: A real time traffic information collection and monitoring system for improved road transportation is the objective of this problem statement. The architecture of the system employs Internet of Things (IoT), Sensor Network, RFID, GPS, cloud computing etc. The proposed system is based on IoT and the data collected from large number of sensors and RFIDs is transmitted wirelessly. IoT helps in improving traffic conditions, safety, efficiency and cost of implementation.

E02. Automated Public Transportation System with e-Billing for the Smart Cities

Description: In public transportation system at present we use paper tickets which are printed by a small machine with a key pad. In this system we don't know the details of passengers who are using the public transport. The system requires user details in order to provide security during identification process. The details are also required in order to provide notifications via SMS to the user. The problem statement is automatic ticketing with e-billing through IoT technologies.

E03. Automatic Path Navigation for the Wheel Chair/ Vehicle.

Description: The objective of this theme is to develop an intelligent wheelchair system to support safe mobility for disabled or elderly people with various impairments. This model must have two main functions: obstacle detection and avoidance, and situation recognition.

E04. Driver-less Car.

Description: The objective of this problem statement is to develop a prototype model of an autonomous car or driverless car that uses a combination of sensors, cameras, radar and artificial intelligence (AI) to travel between destinations without a human operator.

E05. An Intelligent Accident Avoidance System.

Description: The objective of this theme is to make the automobiles with more interactive and intelligent for avoiding accidents on roads. In order to prevent from accidents, different sensors are used to observe fatigue levels of driver, pulse rate, alcohol level, obstacle detection and also sudden collisions.

E06. Smart Farming

Description: The aim of this problem statement is to develop a IoT based system for Smart Agriculture. The system should assist the farmers in getting Live Data (Temperature, Soil Moisture etc.,) for efficient environment monitoring which will enable them to do smart farming and increase their overall yield and quality of products.

E07. Smart System for Food Safety Management

Description: Today's globalization of food production chains, their extensive complexity and limitations arising from manual insertion and data processing of products information make it impossible for consumers the task of being informed in real-time. This obstacle can be overcome, and the current level of technology and low implementation costs allow full automation of this process. The objective of this problem statement is to develop a sensors network architecture based on Internet of Things (IoT) components, which is using autonomous embedded modules and radio identification tags (RFID) that will automatically collect data, covering the entire life cycle of the food product and all the factors that influence its chemical composition

E08. Smart Waste Management System:

Description: Waste management from its inception to its disposal is one of the important challenges for the municipal corporations in all over the world. Smart waste management is an idea where we can control lots of problems which disturbs the society in pollution and diseases. The waste management has to be done instantly else it leads to irregular management which will have adverse effect on nature. The Smart waste management is compatible mainly with concept of smart cities. Smart Dust-bin systems are the primary method to collect waste. The main objectives of smart waste management system includes : 1. Monitoring the waste management. 2. Route planning for garbage collection,. 3. Avoiding human intervention. 4. Reducing human time and effort 5. Resulting in healthy and waste ridden environment.

E09. Smart and Intelligent Home Automation with Customized Settings:

Description: Internet of Things (IoT) allows us to implement home automation system that can be controlled remotely through internet. The proposed system can monitor different

parameters like gas, light, motion detection, temperature, etc. using the sensor data and also trigger a process according to the requirement. The data from the sensors are uploaded to a cloud server and this data can be used to analyze the parameters.

E10. Development of Smart System for Women Safety

Description: Today in the current global scenario, the prime question in every girl's mind, considering the ever rising increase of issues on women harassment in recent past is mostly about her safety and security. The aim of this theme is to develop a device which is the integration of multiple devices, hardware comprises of a wearable “Gadget” which continuously monitor the scenarios around the girl and stream the data whenever there is a need.

E11. Development Smart System for the Remote Health Monitoring of Elderly Patients

Description: In a world with an accelerated population aging, there is an increasingly interest in developing solutions for the elderly living assistance. The Internet of Things is a new reality that is completely changing our everyday life and promises to revolutionize modern healthcare by enabling a more personalized, preventive and collaborative form of care. Aiming to combine these two important topics, this problem statement presents an IoT-ready solution for the elderly living assistance which is able to monitor and register patient’s vital information as well as to provide mechanisms to trigger alarms in emergency situations.

E12. Smart System for Hazardous Gas Detection

Description: The core objective of the Smart City mission is to develop the clean and sustainable solution that helps to improve the quality of the living environment. No city can be smart without the smart sewage management system. Sewer gas is a complex mixture of toxic and nontoxic gases produced and collected in sewage systems by the decomposition of organic household or industrial wastes, typical components of sewage. High concentrations of hydrogen sulfide (>150 ppm) can produce olfactory fatigue, whereby the scent becomes undetectable. At higher concentrations (>300 ppm), hydrogen sulfide can cause loss of consciousness and death. Very high concentrations (>1000 ppm) can result in immediate collapse, occurring after a single breath. In worst cases, it may lead to the collapse of the structure with significant cost for its rehabilitation. The objective of this problem statement is to develop a model to detect the hazardous gas level in remote locations using sensors and send these data to the centralized server to monitor.

F. Augmented Reality

F01. A mobile application for textbooks that enhances the reading experience for school students.

Description: By scanning their physical textbooks, students can highlight, share, add notes, and watch videos, creating a more immersive learning experience. Steps to do

- Create an Android App
- Scan the text book
- Extract words from the book using OCR
- Connect to internet and search wiki based on the keyword.

G. Artificial Intelligence

G01. Add an intelligent feature as a software module in the existing scanner software which do not scan an empty white/color page/tray(without paper).

G02. Design a intelligent software which predicts a machine in LAN may fall for maintenance within a week.

G03. Add an intelligent feature as a software module in the existing CCTV infrastructure which reports the unusual activity. (Ex: Petrol theft identification in an unmanned parking zone).

G04. Identify the service parameters of an air conditioner and predict its next service date in which the software need to submit a service request to the respective company customer care.

G05. Identify the service parameters of a two-wheeler (Scooter/Bike) and predict its next service date in which the software needs to alert the user through an indicator for service due.

H. Cloud Computing and Automation

H01.

Scenario involves water usage and temperature data

- For one house
- For one neighborhood
- For one city (multiple neighborhoods)
- Each team works with a “gateway” database
 - Gateway can represent the data for one house
 - “historical” data for house/can be generated
 - Current sensor data can be generated or using sensor(s) on the participant’s own device
- “Cloud” database can also be created to represent the consolidation of the gateway databases, which would represent all the homes

H02.

Work with the local gateway data and correlate the temperature and water consumption data for one home

- Establish real world scenario around cost savings (examples)
 - Water more than XXX gallons per month is more expensive
 - Water delivered during peak hours is more expensive
 - Water delivered when temperature exceeds a threshold is more expensive
- Define thresholds/triggers to respond to the sensor data and the analytics
 - When to water the lawn
 - When to activate the clothes washer, dishwasher, etc.
- Build a (dashboard?) application to allow the home owner to interact with the data
 - See what is going on – real time and historical
 - Establish thresholds/triggers/actions to activate lawn sprinklers, washing machine, dishwashers, fill swimming pool, etc.
- Incorporate the Cloud (city level) data to provide comparisons between local house and the entire city

H03.

- Work with the Cloud data and correlate the temperature and water consumption data for the city
- Determine some capacity and cost valuations for water resources (examples)
 - How much water can the system deliver?
 - Potable water could be more expensive than non-potable water. Some ways to analyze the data with these variations.
- Establish real world scenario around this data (examples)
 - Which neighborhoods/homes use the most water?
 - Relationships between temperature and water consumption
 - Forecasting future water usage based on previous water usage and temperature data
 - Forecasting infrastructure enhancements in water delivery system to be able to
- This approach involves creative analytics on the data and developing ways to present it.

H04.

- Scenario involves weather forecasting
 - Uses barometer, temperature and humidity sensors on iOS and Android devices
- Develop application to display this data on the mobile device
- Upload data to the “Cloud” database
 - Historical sensor data can be generated
 - We can locate a real weather dataset to be used for historical data
- Develop some strategy to correlate the data and a mechanism to present it.

H05.

- Scenario involves a home security system
- Virtual sensors generating data for:
 - Doors and windows opening and closing
 - Lights on and off
 - Smoke alarm on and off
 - More
- Virtual sensors upload data to the home “gateway” database

- Develop (mobile?) application to display to view the status of the home and to (virtually) interact with various components: (examples)
 - Arm and disarm the security system
 - Turn on/off the lights
 - Turn off the lawn sprinklers
 - Develop some other views of the data and a mechanism to present it

H06.

- Scenario involves a parking garage assigning parking spaces
- Each parking space is instrumented, for example:
 - Occupied/empty
 - Time of event
- Each car could have some identifier (RFID?)
- Virtual arrival and departure of cars at various times
- Some percentage of cars represent short term parkers (shoppers) vs. some are long term parkers (workers)
 - Program assigns parking spots
- Virtual sensors upload data to the garage “gateway” database
- Mobile program for driver to view parking garage, parking space assignment and fee for parking
- Administration program viewing all the parking assignments and billing
- “Cloud” database would represent consolidated view of all of the parking garages in the city
- Cloud database would help city planners:
 - Capacity planning – are there enough parking spaces?
 - How many cars are turned away?
 - Billing strategy – higher charges for peak hours?
- This approach involves creative analytics on the data and developing ways to present it.

H07.

- Scenario involves a delivery company truck fleet maintenance
- Each truck is instrumented, for example:
 - Mileage
 - Weight
 - Fuel level

- Tire pressure
- Time
- Driver
- Virtual truck assignments at various times
 - Various distances and weights
- Virtual sensors upload each trip's data to the trucking company's "gateway" database
- Gateway database also maintains (examples)
 - Which trucks are in service?
 - Service intervals
 - Fuel usage
 - Tire replacement
 - Driver information (how many hours driven and using which trucks)
- Mobile program for driver to view current status and maintenance history of current truck
- Administration program viewing status for all the trucks
 - Which trucks are not available because they are in the shop?

H08.

- Scenario involves a health care monitoring device which reads (for example)
 - Heart rate
 - Blood pressure
 - Respiration
 - Oxygen levels
- Virtual sensors upload data to the hospital floor's "gateway" database
- Data for some of these sensors should be arriving each second
- Need to respond to urgent situations (heart rate = 0) in real time
- Dashboard type program to allow monitoring of each patient from central location
 - Mechanism to establish individual alert thresholds for each patient
 - View historical data as well as current data.