BASE PAPER 1:

TRACKING THE COVID ZONES THROUGH GEO-FENCING TECHNIQUE

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ABSTRACT:

- Because of the outbreak of Covid 19, the entire world is thinking of new strategies, preventive measures to safeguard the human life from the widespread of the pandemic.
- The areas where people are affected are marked as containment zones and people are not allowed to exit out of those areas.
- Similarly, new people are not allowed to enter inside those areas. Hence, the purpose of this paper is to propose a methodology to track the Covid zones, to enhance and tighten the security measures.
- A geo-fence is created for the containment zone.
- The person who enters or exits out of that particular zone will be monitored and alert message will be sent to that person's mobile.
- After tracking the location of a suspicious individual, the geo-fenced layer is mapped in the area and then the virtual perimeter is used for further trapping process.
- This geofenced layer can be viewed by the citizens as soon as it is updated by the Covid monitoring team.
- The geofencing is a concept of building a virtual perimeter area.
- This virtual perimeter monitoring system helps in monitoring the containment zones effectively.

- It reduces operational costs by using an automated system based on wireless infrastructure. It also alerts the authorities immediately to catch the violators.
- Thus, it helps to speed up the process of inspecting the containment zones and monitoring the individuals who violate the rules given by government.

BASEPAPER 2:

A CASE STUDY FOR ASSURED CONTAINMENT

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- Jeffrey M. Maddalon
- Natasha A. Neogi NASA Langley Research Center NASA Hampton, Virginia USA

ABSTRACT:

- While incremental steps are being taken to integrate unmanned aircraft systems (UAS) into the various national airspace systems, much work remains to establish appropriate regulatory infrastructure that allows UAS larger than 55 lb to operate for commerce.
- The magnitude of that effort is compounded by the wide-ranging variety of UAS types and possible applications, as well as the diversity in quality and provenance of UAS components.
- The FAA has suggested developing design standards tailored to specific applications and operating environments as an approach to facilitate integration and safe operation of some UAS.
- This paper introduces a case study to investigate design standards for a midsize unmanned rotorcraft operating in a rural environment. A key aspect of this study is the concept of using a certifiable containment system, different from a conventional

geofencing application, to ensure that the unmanned aircraft does not escape its intended operational area.

- The proposed assured containment system is expected to reduce the effort needed to regulate some UAS that could not currently meet rigorous aircraft design standards and fall outside of the parameters for operation outlined in the proposed small UAS rule.
- This paper discusses how assured containment may be a useful approach to limiting risk and reducing an otherwise prohibitive certification burden to enable UAS operations in confined areas.
- The case study examines the potential effect the assured containment approach might.

BASEPAPER 3:

A SURVEY OF COVID-19 CONTACT TRACING APP

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- School of Computer Science and Engineering (CSE), University of New South Wales (UNSW), Sydney, NSW 2052, Australia
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ABSTRACT:

- The recent outbreak of COVID-19 has taken the world by surprise, forcing lockdowns and straining public health care systems.

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- COVID-19 is known to be a highly infectious virus, and infected individuals do not initially exhibit symptoms, while some remain asymptomatic.
- Thus, a non-negligible fraction of the population can, at any given time, be a hidden source of transmissions.
- In response, many governments have shown great interest in smartphone contact tracing apps that help automate the difficult task of tracing all recent contacts of newly identified infected individuals.
- However, tracing apps have generated much discussion around their key attributes, including system architecture, data management, privacy, security, proximity estimation, and attack vulnerability.
- In this article, we provide the first comprehensive review of these much-discussed tracing app attributes.
- We also present an overview of many proposed tracing app examples, some of which have been deployed countrywide, and discuss the concerns users have reported regarding their usage.
- We close by outlining potential research directions for next-generation app design, which would facilitate improved tracing and security performance, as well as wide adoption by the population at large.

BASEPAPER 4:

DEVELOPMENT OF AN ANDROID APPLICATION FOR VIEWING COVID-19 CONTAINMENT ZONES AND MONITORING VIOLATORS WHO ARE TRESPASSING INTO IT USING FIREBASE AND GEOFENCING

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- Amlan Protim Hazarika Jadavpur University
- Sudarshana Ghosh Jadavpur University
- Dilip Sing Jadavpur University
- Rajib Bandyopadhyay Jadavpur University

ABSTRACT:

- The World Health Organization has declared the outbreak of the novel coronavirus, COVID-19 as pandemic across the world.
- With its alarming surge of affected cases throughout the world, lockdown and awareness (social distancing, use of masks etc) among people are found to be the only means for restricting the community transmission.
- In a densely populated country like India, it is very difficult to prevent the community transmission even during lockdown without social awareness and precautionary measures taken by the people. Recently, several containment zones had been identified throughout the country and divided into red, orange and green zones, respectively.
- The red zones indicate the infection hotspots, orange zones denote some infection and green zones indicate an area with no infection.
- This paper mainly focuses on development of an Android application which can inform people of the COVID-19 containment zones and prevent trespassing into these zones.
- This Android application updates the locations of the areas in a Google map which are identified to be the containment zones.

- The application also notifies the users if they have entered a containment zone and uploads the user's IMEI number to the online database. With this IMEI number, the police can keep an eye on the people who are frequently violating the lockdown rules.
- To achieve all these functionalities, many tools and APIs from Google like Firebase and Geofence are used in this app.
- Therefore, this application can be used as a tool for creating further social awareness about the arising need of precautionary measures to be taken by the people.

BASEPAPER 5:

TECHNOLOGICAL AND ANALYTICAL REVIEW OF CONTACT TRACING APPS FOR COVID-19 MANAGEMENT

- Rajan Gupta, Gaurav Pandey, Poonam Chaudhary & Saibal K Pal

ABSTRACT:

- Role of technology is improving for COVID-19 management all around the world.
- Usage of mobile applications, web applications, cloud computing, and related technologies have helped many public administrators worldwide manage the current pandemic.
- Contact tracing applications are such mobile app solutions that are used by more than 100 countries today.
- This study presents a structured research reviewbased framework related to multiple contact tracing applications.

- The various components of the framework are related to technological working, design architecture, and feature analysis of the applications, along with the analysis of the acceptance of such applications worldwide.
- Also, components focusing on the security features and analysis of these applications based on Data Privacy, Security Vetting, and different attacks have been included in the research framework.
- Many applications are yet to explore the analytical capabilities of the data generated through contact tracing.
- The various use-cases identified for these applications are detecting positive case probability, identifying a containment zone in the country, finding regional hotspots, monitoring public events & gatherings, identifying sensitive routes, and allocating resources in various regions during the pandemic.
- This study will act as a guide for the users researching contact tracings applications using the proposed four-layered framework for their app assessment

BASEPAPER 6:

APPLICATION FOR COVID-19 REAL TIME COUNTER

- Omkar Dhok, Yash Dasouni, Harsh Dubey, Prasanna
- International Journal of Research in Engineering and Science (IJRES)

ABSTRACT:

- The World Health Organization has declared the outbreak of the novel coronavirus, Covid-19 as pandemic across the world.
- With its alarming surge of affected cases throughout the world, lockdown, and awareness (social distancing, use of masks etc.)

among people are found to be the only means for restricting the community transmission.

- In a densely populated country like India, it is very difficult to prevent the community transmission even during lockdown without social awareness and precautionary measures taken by the people.
- Recently, several containment zones had been identified throughout the country and divided into red, orange and green zones, respectively.
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- This Android application updates the locations of the areas in a Google map which are identified to be the containment zones.
- The application also notifies the users if they have entered a containment zone and uploads the user's IMEI number to the online database.
- To achieve all these functionalities, many tools, and APIs from Google like Firebase and Geofencing API are used in this application.
- Therefore, this application can be used as a tool for creating further social awareness about the arising need of precautionary measures to be taken by the people of India.

BASEPAPER 7:

GEOFENCING REQUIREMENTS FOR ONBOARD SAFE OPERATION MONITORING

- Christoph Torens1 ·
- Florian Nikodem1 ·
- Johann C. Dauer1 ·
- Sebastian Schirmer1 ·
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ABSTRACT:

- The new concept for operation of drones, published by EASA in 2015, enables new ways to infuence and possibly reduce the necessary safety targets of certain system components without reducing the overall safety of the unmanned aircraft system (UAS).
- Based on the safety assessment, the specifc category enables new aircraft system architectures and mission designs.
- In this context, this paper analyzes runtime monitoring as a strategy to contain the UAS in its operational volume.
- To assure predefned properties in fight and thus assure the safety of the operation in progress with a high robustness, a formal methodology for safe operation monitoring is utilized.
- With this approach, this work targets to link the concept of safe operation monitoring with the upcoming regulations regarding the specifc category and the specifc operation risk assessment.
- monitoring is geofencing, the capability to contain a UAS in a previously restricted area. In the regulatory framework of a specifc operation, risk assessment is required and so is the containment of the UAS in its operational volume.
- The functional and safety requirements for geofencing regarding their impact on the underlying specifc operation risk assessment are discussed.

- To facilitate this discussion, a taxonomy of geofencing characteristics is derived based on a literature survey.
- Consequently, the geofencing requirements are assessed regarding their robustness and applicability for certifcation purposes.
- As a result, by monitoring the integrity of the system at runtime using geofencing as an example, it is investigated if the requirements and thus costs of development and certifcation process for the remaining components can be reduced.

BASEPAPER 8:

COVID-19 HOME QUARANTINE ENFORCEMENT

- Jiajie Tan,
- Edmund Sumpena,
- Weipeng Zhuo,
- Ziqi Zhao,
- Mengyun Liu, and
- S.-H. Gary Chan

ABSTRACT:

- Containment is the first-priority measure in infection control to curb the spread of highly infectious diseases such as COVID-19.
- Home quarantine is one such measure to keep people at their accommodations for the incubation period (typically 14 days).
- Compared to dedicated monitoring centers, home quarantine is a more cost-effective and comfortable approach to isolate a large number of low-risk people.

- However, efficient monitoring of confinees inside their accommodations is a challenging problem because the quarantined locations are scattered throughout the city.
- We propose and study SignatureHome, an automated IoT-based geofencing algorithm to cost-effectively monitor confinees.
- The core principles of SignatureHome was adopted by the Hong Kong government and implemented as an app to enforce home quarantine order in March 2020 for hundreds of thousands of entrants from other regions.
- The system employs waterproof Bluetooth Low Energy wristbands that are uniquely paired with the confinees' smartphones. SignatureHome uses the identifiers of the environmental network facilities (Wi-Fi access points and cellular networks) as the home signature.
- By comparing the current observed signals of the phone with the home signature, the algorithm can efficiently determine whether the user is within the geofenced area. SignatureHome is computationally efficient, responsive, privacy-preserving, cost-effective, and adaptive to home diversity and changing environments.
- Our experimental results validate its design and high accuracy in terms of precision, recall, F-measure, and false alarm rate.