Harnessing Data and Technology to Combat COVID-19 - Smart4COV19 Project

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Introduction

Overview: The Smart4COV19 project aims to integrate advanced telemedicine and remote sensing technologies to combat COVID-19 and enhance urban resilience.

Goals:

- Rapid identification of COVID-19 and similar infections
- Prevention of person-to-person transmission
- Development of a comprehensive health integration system

System Components

Technologies Used: GNSS (Global Navigation Satellite System)

on smartphones Affordable GNSS receivers

LIDAR technology

3D smart city model

Features:

Smartphone app linked with GNSS positioning COVID-19 spatial database

Environmental monitoring for weather and air pollution correlation

3D Smart City Model

Functionality:

Tracks individual data
Accessible via a smartphone app
Helps in monitoring disease spread and planning responses

Data Utilization:

Combines GNSS, LIDAR, and COVID-19 data
Maps zones of risk based on structures and crowd density

Telemedicine Integration

Benefits:

Provides support to mildly ill patients Reduces exposure to COVID-19 cases

Utilizes smartphones for remote consultations and monitoring

Sensors Used:

Heart rate

Oxygen levels

Temperature sensors

Environmental Monitoring

Objective:

Assess the impact of weather and air pollution on COVID-19 risk

Data Sources:

TROPOMI-S5p aerosol data

PM concentrations over Burgas, Bulgaria

Findings:

Correlation between weather patterns, air quality, and COVID-19 transmission

Air Quality Monitoring

Locations:

Sofia and Burgas, Bulgaria

Tools:

IQAir Visual outdoor stations

Monitors PM1, PM2.5, PM10, temperature, humidity, and pressure

Impact:

Provides real-time data on air quality

Assesses respiratory risks linked to fine particulate matter

Data Integration and Analysis

Geodatabase Model:

Combines reference, satellite, meteorological, and COVID-19 morbidity data Visualized using ArcGIS Pro

Outputs:

Maps displaying air quality and COVID-19 cases Analysis of spatial patterns and risk factors

Conclusion

Summary: Smart4COV19 leverages advanced technologies for effective COVID-19 detection and management, contributing to resilient and responsive urban healthcare systems.

Future Directions:

Expansion of telemedicine capabilities
Further integration of environmental and health data Continued development of smart city infrastructure

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Thank you for your Attention!

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Q&A

Questions and Discussion: ```