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Implementing GPS technology and Susceptibility Analysis to Manage Landslides in Densely-populated Urban Areas

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Abstract: Hong Kong is a densely-populated city with over 60% of its land area covered by mountainous terrain. The city is subjected to torrential rainfall every year. Both steep slopes and intense rainfall present ideal conditions for landslides. On average, 300 landslides are reported every year; 21 of these landslides have resulted in fatalities over the past two decades. Landslides cause tremendous damage to infrastructure and frequently disrupt transportation lines, leading to severe economic consequences. As human development continues to encroach upon hillsides and as extreme rainfall events occur with increasing frequency due to climate change, the danger associated with landslides will inevitably increase. To address this hazardous phenomenon, Hong Kong needs to focus on improving their ability to manage landslides. In this project, a new smart Landslide Information System (LIS) is developed as a mobile app. The LIS uses smart technology by leveraging the vast amount of mobile phone users in densely-populated urban areas, crowdsourcing, to manage landslides incidents. The mobile app allows public and emergency responders to receive real-time landslide data, including the obstruction of transportation lines by landslides and high risk landslide areas. By implementing an existing susceptibility model for landslides and GPS technology, the LIS can alert the general public when they enter these potential high-risk landslide areas.
Keywords: GPS Technology; susceptibility modelling; landslides; smartphones