

Disaster-Resilient Communication Network" to help flood, landslides victims by IIIT-Delhi

India has witnessed raging monsoon this season with landslides and floods taking over 900 lives in more than 16 states. States like Assam, Maharashtra, Bihar, and Kerala have been hit the worst and red alerts have been issued in many districts. There is an urgent requirement of disaster management teams with a proper communication network to connect and rescue victims on an urgent basis. This is even more important, given that the world is already struggling with the Coronavirus pandemic.

When a disaster occurs, the worst-hit areas are the ones that require the most help. However, due to the failure of the traditional cellular network in the disaster-affected areas, it is impossible for the rescue teams to disseminate important information to the local population and for the local population to contact the remotely located emergency control rooms.

Consequently, in the paper titled "**Multi-Hop D2D Framework for Disaster-Resilient Communication Network**", the authors, Mansi Peer (PhD Student, IIITD), Dr. Vivek Ashok Bohara (Faculty, IIITD) and Prof. Anand Srivastava (Faculty, IIITD) present a disaster-resilient communication network that utilizes multi-hop device-to-device (D2D) communication to connect to active base stations (BSs) outside a disaster-affected area for potential application in fifth-generation (5G) cellular networks. They propose a novel multi-hop D2D framework where user-BS (source-destination) pairing are optimized jointly with routing and scheduling to maximize the number of covered users in the disaster-affected area within a given time frame.

The proposed work provides an alternative high data rate cellular connectivity for the emergency first responders (EFRs) such as fire fighters, rescue teams, medical service providers as well as users in the disaster affected area.

At present, the search and rescue teams in disaster area rely on the legacy public safety communication networks (such as TETRA, APCO 25 etc.) to communicate, which generally support only voice services, whereas the proposed technology can support both voice and multimedia broadband services.

We have also extended the above work to a scenario where the coverage in a disaster area is further enhanced by incorporating multiple Unmanned Aerial Vehicles (UAVs). The UAVs track the user location in a disaster area and accordingly optimize their 3D placement.

The paper has been accepted for presentation at the **IEEE (Institute of Electrical and Electronics Engineers) 5G World Forum, 2020**.

Please let us know if you would like to know more about the material and suggestions incorporated in this paper on **Disaster-Resilient Communication Network**, prepared by the team at **IIIT-Delhi (Indraprastha Institute of Information Technology Delhi)**.