# Smart-City Emergency Edge Platform Using Decentralised BLE Mesh Communication

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## Abstract

Climate change-related disasters, including extreme weather events, floods, and forest fires, pose significant risks not only to urban physical infrastructure but also to communication systems. During disasters and emergencies, damage to or disruption of conventional communication infrastructure can hinder the transmission of distress calls and coordination with emergency response teams.

This project aims to develop a decentralised emergency communication platform that enables communication between mobile devices when centralised communication infrastructure is unavailable.

The proposed system uses a mesh communication approach based on *Bluetooth Low Energy* (BLE). Within this network, SOS messages, location information, and other critical emergency data generated by users can be transmitted between nearby devices.

The system is designed to relay messages between devices within the network until they reach an appropriate connection point or a dashboard accessible to rescue teams. This approach aims to establish a local emergency communication network that does not depend entirely on cellular networks or centralised communication infrastructure.

The project is particularly relevant to maintaining communication continuity and strengthening emergency response capacity during disasters such as forest fires, floods, and extreme weather events.

The expected outcome is the development of a functional prototype and a demonstration of its scalability under suitable field conditions.

The proposed approach aims to develop a solution that applies digital technologies to climate change adaptation, disaster management, and smart-city applications.

**Keywords:** Smart cities, disaster management, BLE mesh, decentralised communication, climate resilience.

**MİDUG Thematic Area:** WP6 – Digital Climate Solutions and Disaster Resilience.