

NEXT GENERATION OF EMERGENCY SYSTEM BASED ON WIRELESS SENSOR NETWORK

Tech ID: 33472 / UC Case 2024-097-0

PATENT STATUS

Country	Type	Number	Dated	Case
Patent Cooperation Treaty	Published Application	WO 2026/036086	02/12/2026	2024-097

BRIEF DESCRIPTION

Recent mass evacuation events, including the 2018 Camp Fire and 2023 Maui Fire, have demonstrated shortcomings in our communication abilities during natural disasters and emergencies. Individuals fleeing dangerous areas were unable to obtain fast or accurate information pertaining to open evacuation routes and faced traffic gridlocks, while nearby communities were unprepared for the emergent situation and influx of persons. Climate change is increasing the frequency, areas subject to, and risk-level associated with natural hazards, making effective communication channels that can operate when mobile network-based systems and electric distribution systems are compromised crucial.

To address this need UC Berkeley researchers have developed a mobile network-free communication system that can function during natural disasters and be adapted to most communication devices (mobile phones and laptops). The self-organized, mesh-based and low-power network is embedded into common infrastructure monitoring device nodes (e.g., pre-existing WSN, LoRa, and other LPWAN devices) for effective local communication. Local communication contains dedicated Emergency Messaging and “walkie-talkie” functions, while higher level connectivity through robust gateway architecture and data transmission units allows for real-time internet access, communication with nearby communities, and even global connectivity. The system can provide GPS-free position information using trilateration, which can help identify the location of nodes monitoring important environmental conditions or allowing users to navigate.

SUGGESTED USES

- » Communication within local communities during mobile-network and/or electric grid failures
- » Planning and communicating of evacuation routes during natural disasters

ADVANTAGES

- » Optimized, self-organized mesh network uses commonly-installed environmental monitoring nodes for low-power and wide-area communication
- » GPS-free trilateration for person or environmental-monitoring node position tracking

CONTACT

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INVENTORS

- » Soga, Kenichi

OTHER INFORMATION

CATEGORIZED AS

- » **Communications**
 - » Internet
 - » Networking
 - » Other
 - » Wireless
- » **Computer**
 - » Hardware
 - » Other
 - » Software
- » **Environment**
 - » Other
 - » Sensing
- » **Engineering**
 - » Engineering
 - » Other
- » **Security and Defense**
 - » Food and Environment
- » **Sensors & Instrumentation**
 - » Analytical
 - » Environmental Sensors

» Broad utilization of available: WSN, LoRa, and other LWAN devices; ISM frequencies (2.4GHz, 915 MHz 868 MHz and 433 MHz); 3/4/5/6G networks; Ethernet; Bluetooth; WiFi; and RS-232, RS-485, and USB connections, for extensible and robust network

» [Other](#)

» [Physical Measurement](#)

» [Position sensors](#)

» [Scientific/Research](#)

RELATED MATERIALS

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