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Skynet: A Swarming Drone System for Smart Disaster Management

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Communication technologies play an important role in the case of disaster management to propagate and convey information to the concerned authorities. In October 2015, Southern Kansas suffered forty two earthquakes of magnitude 2.5, representing 17% of earthquakes world-wide in that month. With this, we need accelerated efforts to develop a robust and well-defined disaster management communication system to avoid loss of life in Kansans. In addition to educating the populous in general, we must take advantage of modern technologies to create an emergency communications framework to alert people of potential risks and hazards and to help first responders initiate fast and efficient search and rescue efforts. More specifically, in the case of a disaster, mobile communications may not function due to potential damage to the provider infrastructure. However, people in the disaster areas still need to use internet based applications such as WhatsApp, Facebook, Internet Explorer, etc. to receive the latest information and contact friends and family members. Moreover, the first responders need to exploit Cloud Computing applications, e.g., facial recognition, google map, and infrastructure health assessment, to perform efficient and effective rescue operations. Networks for these applications can be easily established with mobile hotspots because of their flexible and minimal infrastructure. In our project we will design and develop an intelligent swarming drone system to provide mobile Wi-Fi hotspots to critical places where rescue is most needed. These drone swarms will automatically form an aerial wireless mesh network and provide high-speed Wi-Fi networking services over a large geographic area to provide the best information needed in an emergency.