

**Abstract:**

Unmanned aerial vehicles (UAVs) can be used as aerial wireless base stations when cellular networks go down. Prior studies on UAV-based wireless coverage typically consider an Air-to-Ground path loss model, which assumes that the users are outdoor and they are located on a 2D plane. In this paper, we propose using a single UAV to provide wireless coverage for indoor users inside a high-rise building under disaster situations (such as earthquakes or floods), when cellular networks are down. We assume that the locations of indoor users are uniformly distributed in each floor and we propose a particle swarm optimization algorithm to find an efficient 3D placement of a UAV that minimizes the total transmit power required to cover the indoor users.