Poster: Homecoming: A Wireless Homing Device for UAVs

Abstract

Unmanned Aerial Vehicles (UAVs) are quickly becoming a viable delivery platform for physical packages with promise to transform the retail industry's supply chains. This work focuses on the last leg of such delivery: physically approaching a customer's landing zone. This has traditionally relied on a combination of GPS and computer-vision to locate and identify a landing zone. Instead of using computer vision, we propose to use ultra-wideband beacons (UWB) to assist in the landing process. The UAV's location relative to the landing zone is continuously measured based on the wireless propagation delay between the UAV and the landing zone's corners. We show that a single pair of wireless devices, one at the UAV and one at the landing zone, suffices to obtain the UAV's location. The landing zone's UWB device, connected to multiple antennas, receives multiple copies of the UAV's signals, that enables a sub-decimeter 3D-localization of the UAV. This helps the UAV's control logic governing the approach and landing process.

This poster has been accepted to MobiCom 2020. The camera-ready version is being prepared. We will provide a link to the proceedings once it is published.