Campus Bluetooth Tag Network

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Project Number CS 317

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This project creates a network of phones and low-cost Bluetooth tags to assist members of the campus community locate lost items. Users attach small Bluetooth Low Energy (BLE) tags to their possessions. Using an iOS or Android app, the user’s phone will passively monitor their tags, recording the last known GPS locations of their items. If the user loses a tagged item, they may use their phone to recall the last known location. Using a CrowdGPS model, the locations of lost items will also be anonymously reported by all other devices in the network.

These features are similar to existing commercial products. We improve upon these alternatives by customizing our open-source product to college campuses. We use small Raspberry Pi computers as fixed-location scanners throughout campus. GPS location suffers indoors due to reduced signal accuracy. Our system uses these fixed scanners to report precise locations, such as the exact floor or room in a building. We also envision potential extensions with campus security. Following conversations with the VCU Police Department, this system has the potential to reduce loss and theft as well as provide data to better plan patrol routes and manage resources around campus. Finally, we note that these extensions are not only applicable to academic campuses, but also to corporate campuses.

Using funds from the Mark A. Sternheimer Senior Design Award, we purchased 80 tags and conducted a small beta test with students on campus. Results from the test helped make improvements to usability and reliability.

Keywords: Mobile apps, CrowdGPS, Bluetooth Low Energy (BLE), Raspberry Pi

