Map-less Indoor Navigation and Meet-up Using Smartphones

When traveling to somewhere new or unfamiliar, it’s common practice nowadays to pull out a smartphone and turn on the GPS function to make navigation easier. But if the final destination is in an un-mapped area or inside a large building, current technology often stops at the door. Tenants inside a mall or office building often must rely on traditional maps or directions to reach out to visitors, and are beholden to the priorities of the property owner and/or large mapping firms to bring services to their location. FollowUp is a new ad-hoc route-making technology that will empower anyone to easily create navigation routes to indoor locations that visitors with a smartphone can easily follow to reach a store, business, or meeting.

Natural magnetic disturbances create unique route signatures

FollowUp employs a leader-follower system using smartphones and their built-in inertial sensors and magnetometers to create navigable routes. A leader (such as a store owner or a meeting organizer) creates a route from a known starting point (such as where GPS navigation stops) by walking from that point to the intended destination. FollowUp saves a route trace of the walk and the measured step parameters and magnetometer profiles. This trace can then be distributed to potential shoppers, meeting attendees, and others, who can load the trace and get live turn-by-turn directions while inside. Unlike other technologies, FollowUp doesn’t depend on the availability of reliable WiFi hotspots to function, allowing significant battery savings. FollowUp can also robustly adapt to changes in phone orientation and stairs through smart filtering.

Applications

• Indoor turn-by-turn navigation in malls and large buildings
• Share meet-up directions with friends

Advantages

• Easier navigation to stores and businesses without pricey infrastructure or pre-made maps
• Can navigate multiple building levels without multiple files
• Uses less power than many existing methods

Inventors

Kang Geun Shin