Title= CROWD-PAN-360: Crowdsourcing based Context-aware Panoramic Map Generation for Smartphone Users

Abstract:

Recent advances in smartphones and location-aware services necessitateidentifying logical locations of users, in terms of their surroundings, instead of raw location coordinates. In this paper, we have proposed *CROWD-PAN-360* (*CP360*), a novel smartphone-based system to generate 360-degree panoramic map of a querying user for his unfamiliar surrounding using crowd-sourced images. The objects (logical locations) appearing in the images are identified using manually or automatically generated tags. The system is context-aware and it intelligently associates user location coordinates with several smartphone contexts, like acceleration and orientation. *CP360* can significantly reduce GPS positional errors for even cheap low-end smartphones and can identify the user surroundings very efficiently. We extensively tested the system in both indoor and outdoor environments of IIT Roorkee campus using Android smartphones over a dataset of more than 6000 crowd-sourced images of nearly 70 objects (departments, hostels, cafeteria, etc.) and *CP360* generates the panoramic map with an average accuracy of 92.2%.