

**CHENNAI – PONDICHERRY**

**LEVERAGING SPATIAL DIVERSITY FOR PRIVACY-AWARE LOCATION-BASED SERVICES IN MOBILE NETWORKS**

**ABSTRACT:**

While providing unprecedented convenience to people's daily life, location-based services (LBSs) may cause serious concerns on users' location privacy, when the system is compromised. Although various location privacy protection mechanisms have been developed for LBSs, the ambient physical environment often imposes some fundamental limitations on their performances. As a result, mobile users may experience a spatial diversity in the achievable location privacy when traveling along their routes. However, to the best of our knowledge, an appropriate location privacy metric that can capture the influence of the ambient environment is still missing in the literature. Also, none of the existing location privacy protection methods can properly leverage such spatial diversity. With this consideration, new ambient environment-dependent location privacy metrics are proposed in this paper, together with a stochastic model that can capture their spatial variations along the user's route. Based on this modeling, a new optimal stopping-based LBS access scheme that allows mobile users to fully leverage the spatial diversity and achieve a substantially better performance is developed. The effectiveness of the proposed scheme is corroborated by both numerical results and simulations over real-world road maps.