

WiFi Fingerprinting using Bayesian and Hierarchical Supervised Machine Learning assisted by GPS

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Extended Abstract— A robust algorithm is provided to cover large areas using WiFi fingerprinting. The algorithm is based on Random Forest WiFi fingerprinting to predict indoor location with GPS assistance when possible to predict outdoor location. The algorithm is built hierarchically, predicting the building, floor and Lat/Lon over three levels. Every algorithm level relies on a correct prediction from the previous level. Each algorithm level has its own processed features causing dramatic reduction of parameters rather than using raw MAC addresses. Features associated MAC addresses to building and floors were created based on WiFi RSSI parameters. The Random Forest hyper parameters were optimized using carefully chosen cross validation architecture.

Keywords—*IPIN Competition; Smartphone-based (off-site); Multi-sensor positioning*