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GPS Refinement in Cities Using Statistical Approach

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Abstract : GPS plays an important role in everyday life for safe and convenient transportation. While pedestrians use hand held devices to know their position in a city, vehicles in intelligent transport systems use relatively sophisticated GPS receivers for estimating their current position. However, in urban areas where the GPS satellites are occluded by tall buildings, trees and reflections of GPS signals from nearby vehicles, GPS position estimation becomes poor. In this work, an exhaustive GPS data is collected at a single point in urban area under different times of day and under dynamic environmental conditions. The data is analyzed and statistical refinement methods are used to obtain optimal position estimate among all the measured positions. The results obtained are compared with publically available datasets and obtained position estimation refinement results are promising.

Keywords : global positioning system, statistical approach, intelligent transport systems, least squares estimation
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