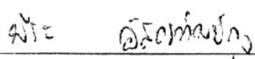


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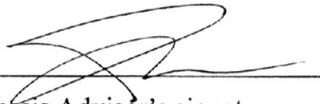
Locating a position in a plain using GPS works well. However, doing so in dense areas of tall buildings may not. Therefore, to locate a position in an area where the radio signals reflect off surrounding terrain-buildings, canyon walls, hard ground, etc., requires the usage of other signal sources such as wireless network access point together with GPS satellites. This research proposes a way in measuring signal traveling time and signal strength between an access point and the locating equipment to calculate a distance. The distance is then used for calculating its position with Triangulation technique. The research presents an adjusted Triangulation technique for the heterogeneous signal sources.

Finding a position with measured signal delay, the average delay value that causes positioning error and its standard deviation are collected and used for simulating with the adjusted Triangulation technique. The results from using all GPS satellites are compared with the positioning result using the hybrid positioning of GPS satellites and WLAN access points. The results show that positioning with two GPS satellites and one WLAN access point is appropriate for positioning with time measurement.

Finding a position with signal strength is done through a simulation using GloMoSim to find fading values and used them to calculate positioning results. The result shows that finding a position using only WLAN access points yields best result using signal strength measurement.



Student's signature



Thesis Advisor's signature

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