

BAB V

KESIMPULAN DAN SARAN

5.1 Kesimpulan

Setelah melaksanakan tahap perancangan dan pembuatan perangkat lunak GUI *Real-time Indoor Positioning System*, kemudian dilakukan tahapan pengujian dan pengukuran. Hasil dan analisis pun telah didapatkan untuk mendapatkan jawaban dari rumusan masalah, sehingga diambil beberapa kesimpulan antara lain:

1. *Node tag* maupun *anchor* dapat berfungsi sesuai kinerjanya, keduanya dapat melakukan pengukuran jarak hingga pada jarak 50m secara LOS dan 30 meter secara NLOS.
2. GUI *Real-time Indoor Position System* Decawave 3000 dibuat dengan perangkat lunak PyCharm IDE dan *library* PyQt6: QtDesigner.
3. Berdasarkan kedua metode TWR yang diterapkan meliputi SS-TWR dan AltDS-TWR, error terkecil diperoleh dengan metode AltDS-TWR dengan error pembacaan jarak rata-rata 1,17%. Sedangkan SS-TWR sebesar 4,27% (tanpa hambatan/LOS).
4. Penerapan Kalman filter berpengaruh hingga menurunkan error menjadi 3,52% pada kondisi trilaterasi SS-TWR. Namun tidak berdampak signifikan AltDS-TWR dari tanpa filter sebesar 1,1% dan tidak berubah secara signifikan.
5. Berdasarkan laporan skripsi ini telah menerapkan metode trilaterasi dalam pengukuran posisi dengan GUI pada rentang 1-5 meter.

5.2 Saran

Berdasarkan hasil proyek skripsi ini masih ada kekurangan dan diharapkan untuk adanya pengembangan lebih lanjut oleh penelitian lanjutan. Beberapa saran untuk pengembangan proyek ini sebagai berikut:

1. Desain tampilan GUI yang lebih informatif dengan fitur kalibrasi dan *tutorial* untuk membantu pengguna dan meningkatkan kenyamanan penggunaan perangkat lunak.
2. Meningkatkan fleksibilitas perangkat lunak agar memiliki kompatibilitas di perangkat mobile lainnya selain laptop berbasis Windows dan Linux, seperti salah satunya Android.
3. Pembuatan sistem lokalisasi secara 3D visual agar hasilnya lebih *reliable* dan akurat.
4. Perlunya tampilan penanda yang otomatis bergerak sesuai arah *tag* sehingga memudahkan pengguna untuk melihat posisi.

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