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ECHO-LESS RANGE FINDING SYSTEM

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Kamilan Naicker

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Abstract

The aim of this research was to investigate a low-cost, ranging finding system, incorporating SONAR and RF-Beacon technology to determine distances for mobile robotic navigation. This hybrid system measures the propagation of an audible sound wave from a SONAR transmitter to a SONAR beacon. Rather than relying on the sound wave to be reflected back to the transmitter, a radio signal is used for the time-of-flight (TOF) measurement.

The first objective of this research was to investigate the variety of range finding methodologies that employ the TOF measurements currently used for mobile robotic navigation and review the application methodologies and limitations. The second part of the project is to develop a low cost system for indoor mobile vehicle navigation, which can be easily implemented with microcontrollers and PCs. The final part of this research involved the observation and examination of the hybrid system to check for accuracy and also made a comparison with other systems. The system developed is a working system with a reasonable accuracy. It certainly provides one more options for locating indoor mobile vehicle position.

Presented in this thesis is an in-depth discussion on the development and design process required for the hybrid SONAR system. The research conducted in this project found that the combination of SONAR and RF-Beacon technology can provide an inexpensive system for distance measurement that assists to obtain a mobile vehicle's location.

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