Real-time Indoor Wheel-Based Asset Localization System

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Tracking high value assets is an ongoing pain point in a wide variety of industries, with many solutions available that depend on external GPS, expensive RFID chips, or human-driven interaction. These solutions struggle with fine-accuracy and operating within indoor settings. Teams spend valuable time and resources on continuous tracking of mobile assets which can be better used focused on operational excellence. Examples of high value and time sensitive assets include wheelchairs, crash carts, and portable x-ray machines in the healthcare industry, or manufacturing equipment and forklifts in the manufacturing sector would all benefit from real-time tracking. The ability to seamlessly track and locate an essential piece of equipment can improve quality of life of employees and allow staff to spend more time on job responsibilities and less on finding specific equipment, as well as increase operational efficiency and usage of high value assets.

Our project was aimed at developing an accurate and novel wheel-based asset localization system that can track movement of an asset in real-time without relying on external GPS or user-dependent input. The design behind our product is a real-time localization system application that is product-agnostic with fine detail accuracy that can be implemented in a wide variety of use cases. Our product interprets rotational velocity readings from two gyroscope sensors placed on each wheel and calculates distance traveled and relative location using trigonometric transformations and heading calculations. From this information, we can overlay a user interface to track the asset's movement and new location.

Keywords: Real-time Localization System, Asset Tracking