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## **Systems, Methods and Apparatus for High Accuracy Tracking with Ultra Low Power Wireless Tags**

Category: Wireless Communication and Tracking Technology

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### **Summary**

WaveTag is a groundbreaking tracking technology that utilizes ultra low-power, passive wireless tags for high-accuracy tracking within supply chains, retail, logistics, and more. These tags, costing less than \$2 each, boast a multi-year lifespan, under 50 cm tracking accuracy, and compatibility with commodity smartphones, eliminating the need for dedicated infrastructure or maintenance. WaveTag enables real-time visibility into asset and inventory tracking, leveraging passive non-linear circuits to transform low-frequency signals into UWB preambles for precise location tracking.

### **Development Stage**

Prototype and First Operational Test Complete

### **Problem Statement & Solution**

In today's rapidly advancing world, efficient asset management and tracking are crucial across various industries like logistics, retail, and supply chain management. Current tracking technologies often face challenges such as high costs, frequent maintenance needs, limited operational lifespan, and dependence on dedicated infrastructure. Additionally, existing solutions struggle with accurately tracking multiple items in close proximity.

Researchers at the Georgia Institute of Technology have developed WaveTag, a novel asset tracking technology that addresses these challenges. This solution utilizes ultra low-power, passive wireless tags that work with commodity smartphones, eliminating the need for dedicated infrastructure while offering high accuracy and a multi-year lifespan at a fraction of the cost of traditional systems.

### **Advantages**

- High-accuracy tracking to under 50 cm
- Ultra low-power consumption allowing for several years of operation without maintenance
- Low cost, enabling large-scale deployment
- Compatibility with commodity smartphones, removing the need for specialized reading infrastructure
- Supports tracking multiple tags concurrently, enhancing operational efficiency

### **Commercial Applications**

- Supply chain and logistics for real-time asset and inventory tracking



- Retail for enhanced inventory management and customer experience
- Healthcare for equipment and patient tracking
- Consumer applications for locating personal items
- Immersive media for accurate positioning of devices and users

**Lead Inventor:** Mohammad Rostami, PhD and [Karthikeyan Sundaresan, PhD](#)

**Intellectual Property Status:** US Patent Issued - [WO2024097968A2](#)

**Scientific Publication(s):** Rostami, M., Sundaresan, K., (2022). Enabling high accuracy pervasive tracking with ultra low power UWB tags. [MobiCom '22: Proceedings of the 28th Annual International Conference on Mobile Computing And Networking. Association for Computing Machinery, New York, NY, USA, 459–472.](#)