



## **Abstract**

Avia Vestigo is an indoor tracking system used to monitor the movements of a patient or loved-one in a home care or facility setting. Indoor movement is tracked using a Bluetooth Low Energy (BLE) beacon worn by the patient within a network of sensors. A normal trend pattern of a patient's daily activity is found, and any deviations from that trend trigger automatic notifications to a caregiver or family member.

## **Problem**

As Americans are living longer, the elderly population has grown substantially. The number of Americans 65 and older is expected to double by 2060, from 52 million to over 95 million.<sup>1</sup> Age related health problems will increase, with Alzheimer's cases expected to hit 13.8 million in 2050.<sup>2</sup> More and more families will be burdened with caring for an ever increasing aging population. The ability of working families to care for elderly loved ones will be strained, as many ask, "how do I take care of mom or dad at home?" A technology-based solution is needed to lessen the impact to home care workers and family members in caring for their loved ones.

## **Solution**

Avia Vestigo allows elderly patients and seniors the independence and freedom to live at home, while giving guardians and family members peace of mind. The system consists of a BLE beacon that is worn 24/7 by the patient. An example form factor is a watch-style wristband that is designed to remain on at all times. The beacon emits a BLE signal that is received by a group of sensors in the home, and the signal strength is recorded. A comparison of the signal strength by the sensors determines a relative position of the beacon. As the patient moves about the home over the course of their day, a normalized trend pattern of movement is found. An example of daily activities could include wake up times, movements between the kitchen and living room, or leaving for appointments. Any deviation from the normal trend would trigger an instant alert to the guardian or family members that a potential problem exists. The alert parameters can also be customizable, for example if a patient only needs monitoring during certain days or timeframes, or if alerts for leaving the space are not necessary. A guardian's dashboard is available that allows care givers and family members to glean meaningful insight into the normal activities of their elderly patients, while still maintaining their independence.

*Avia Vestigo is a patent pending innovation product of MI Technical Solutions, Inc., a woman-owned small business, in Chesapeake, Virginia.*

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<sup>1</sup> U.S. Census Bureau, Population Projections

<sup>2</sup> U.S. Census Bureau, Population Projections