



tech briefs

Westinghouse Savannah River Company

Dead Reckoning Pedometer System

at a glance

- Automatic tracking and monitoring
- Versatile applications
- Tracks one or many persons
- Does not impact freedom of movement
- Compact and lightweight
- Long range communication via a single base station
- U.S. Patent 6,549,845

for more information

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Monitors personnel movement in confined spaces

The Dead Reckoning Pedometer (DRP) System offers advanced technology for tracking and recording an individual's movement without interfering with his or her activities. The system can isolate a person's position inside a structure relative to the entrance point.

For example, the movement of firefighters in a burning building could be tracked real-time to follow their progress, identify the location of trapped occupants, or provide information on egress should they need to retreat.

Background

Existing methods are inadequate for measuring the movement of a person in an enclosed space lacking good reference points, or benchmarks. Conventional Global Positioning System signals do not work indoors. Without visible known benchmarks to reference, two-way radio communications cannot pinpoint exact location. Standard pedometers are based on counting the number of steps taken and cannot define direction. They also must be calibrated for a person's stride.

The DRP System uses microelectronic processing elements to render information from magnetometers immediately useful and more accurate. The system comprises a greater range of functions than other systems, including:

- Measuring the movement of a person or robot in a space lacking good reference points.
- Letting a person know exactly where they are in relation to where they started.
- Providing a record of a person's movements.
- Providing a means for people outside the space to follow progress and provide direction to those inside the space.

What it does

Once a firefighter enters a burning building, a digital record of his foot movement is generated in real time. The person can see his path on a local display unit. The path also is transmitted to and displayed on a base unit outside of the building. Here, a person monitoring the operation can give directions to the firefighters inside the building.

The DRP system operates autonomously, and its compact, lightweight design offers the individual a free range of uninterrupted movement.



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Dead Reckoning Pedometer System

How it works

The system comprises a sensing package, a local data receiver/display unit, a transmitter, and a remote base station. The sensing package comprises a magnet, a three-dimensional magnetometer, and a pressure switch mounted on each foot. The data receiver consists of a data logger capable of storing the data from the sensors and a visual readout for instantaneous location identification. The receiver can be belt mounted. A separate radio transmitter sends the data to the base unit.

Expandable functionality

The remote base unit consists of a computer and radio receiver capable of inputting and interpreting the data from the suite of sensors, displaying it on a three dimensional graphical user interface. Floor plans, architectural drawings, topographical maps, and information from other external databases can be used in conjunction with commercially available CAD programs to display a person's movement and enhance the information graphically.

The remote base unit also can be interfaced with other media, such as portable sensors carried by the person or fixed sensors within a facility like motion sensors and microphones. Fire fighters, for example, may carry temperature, oxygen, flammable gas, or oxygen flow sensors, all of which could relay valuable information back to the base station.

Partnering opportunity

The U.S. Patent and Trademark Office has issued Patent No. 6,549,845 on the Dead Reckoning Pedometer System.

Westinghouse Savannah River Company (WSRC) invites interested companies with proven capabilities in this area of expertise to enter a licensing agreement with WSRC to manufacture and sell this system as a commercial product. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention. Qualifications should include past experience at bringing similar products to market, product design and development capabilities, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.

Technology transfer

WSRC operates the Savannah River Site for the U.S. Department of Energy. WSRC scientists and engineers develop technologies designed to improve environmental quality, support international nonproliferation, dispose of legacy wastes, and provide clean energy sources.

WSRC is responsible for transferring technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

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