

RadTrac: Portable and Compact Tracking Radioactive Materials

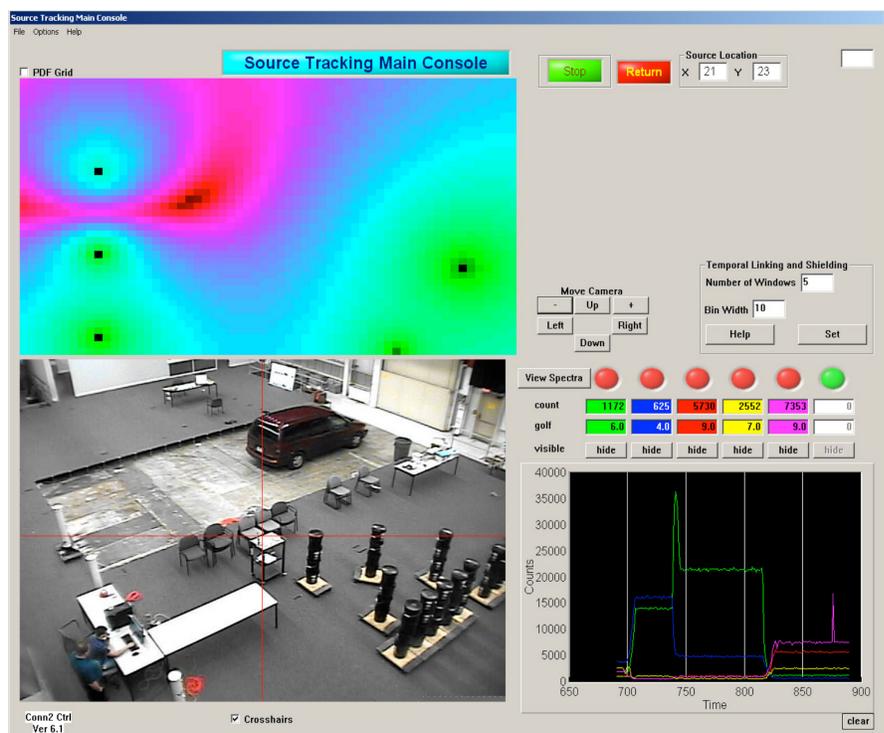
RadTrac combines a radiation detector and video camera to give real-time tracking of moving radioactive sources—a must in this age of terrorism.

Background and Need

To successfully combat potential radiological threats that face public and private interests, there is an identified need for a compact and portable system that can detect and track the illicit introduction of a radiation source at a large public event such as a political convention or sports competition. The ideal system would provide not only stand-off surveillance of people, packages, and vehicles but also provide updated source and position estimates in real time, along with a video feed of the suspected source. The system would also track a host, alert law enforcement personnel, and archive the event. Researchers at Argonne National Laboratory have created RADTRAC to meet these needs.

The Invention

RadTrac is a compact and portable system that runs on a laptop computer and combines a radiation detector with a video camera. When radiation is detected, the video camera follows the source in real time as it travels through the detector's field of view. Simultaneously, the video camera records an image of the radioactive device and personnel in the area. RadTrac is quick to set up, has a low profile, and yields source position to within one foot.



RADTRAC source-tracking main console

Source position is determined using multiple distributed detectors. RadTrac allows a single operator to remotely monitor a site while automatically archiving images and spectra. Precompiled information on detector location and a first principles representation of radiation transport are combined to produce a video camera image showing the location with the highest probability of containing the radioactive source against a backdrop of the monitored site. A software package instantaneously estimates the source position to within a foot or two—something a human operator cannot do using current systems. Because the RadTrac system is portable and supports multiple detectors whose outputs are integrated, detectors can be deployed in arbitrary configurations. The system also compensates for environmental shielding caused by people, concrete, and other columns or barriers. RADTRAC includes a built-in library of radioactive source information so many materials can be automatically identified.

Benefits

- ▶ Compact and portable—runs on a laptop
- ▶ Provides video detection
- ▶ Mobile compared to existing lane-based, bulky radioactive source detection systems
- ▶ Estimates radioactive source position more accurately than a human operator
- ▶ Allows archiving of a radioactive source event video and measurement data

Applications and Industries

RADTRAC can provide monitoring at:

- ▶ Public and private events at stadiums, convention halls and other venues
- ▶ Ports of entry
- ▶ Subways, train stations, airports, highways, and sea ports
- ▶ Hot cell exits where radioactive materials are used, or at nonproliferation sites
- ▶ Defense companies and airport security equipment manufacturers
- ▶ International companies needing additional sensing equipment

Developmental Stage

Proven and validated; ready for commercialization.

Availability

Available for licensing

Argonne Invention Numbers

ANL-IN-05-128 and ANL-IN-09-007

Patent Information

Argonne holds one issued patent and three patents pending for RadTrac, and the software is copyrighted.

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