

dbS Productions



TOTAL DHS SBIR INVESTMENT

\$1.1 million

PHASE III REVENUE

\$450K in sales/year;
company valued at \$5M

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During a search and rescue mission time is of the essence, and determining the probability of finding a missing person within a specified area is hugely advantageous to determine where to focus your efforts. That is why search and rescue expert Robert Koester developed his Lost Person Behavior App with the help of the Department of Homeland Security (DHS) Small Business Innovation Research (SBIR) program. With over 5,000 customers to date, this technology, developed with funding from the DHS Science and Technology Directorate (S&T), is setting new standards for finding missing persons.

The Lost Person Behavior App is a mobile application that provides first responders with a missing person subject profile, tactical briefing, initial actions checklist, investigative questions, and statistics that help determine where to look. The app is the evolution of decades of statistics on lost persons, which Koester has compiled throughout his many years of leading search and rescue missions.

"I started in search and rescue research back in 1981, so I understand the needs and gaps for current technology," says Koester, a neurobiologist who joined the Appalachian Search & Rescue Conference in 1981 and since then has participated in hundreds of searches, including over a hundred as Incident Commander. Koester also authored a book, *Lost Person Behavior: A Search and Rescue Guide on Where to Look – for Land, Air, and Water*. "Search theory involves complex mathematical algorithms, which is why it is not commonly used. I wanted to create a user-friendly tool that didn't require a knowledge of math to use and could easily generate comprehensible results."



The intent of the DHS SBIR project was to provide first responders with the tools necessary to conduct an efficient search and rescue mission, and that is what the project accomplished. “The DHS SBIR program gave me the ability to focus a breadth of data and knowledge into one resource. For the first time, search theory, incident management and mapping were all brought together into one tactical decision aid.”

A review of law enforcement and search and rescue records indicate an average of 125,000 search and rescue (SAR) operations each year for missing Alzheimer’s subjects, so Koester began by creating a dementia profile that defined patterns of lost persons with dementia. These traits are distinctly different than patterns of a lost hunter or hiker, and Koester’s seminal research on lost person behavior (with an early emphasis on dementia) helped to create the International Search and Rescue Incident Database (ISRID). After helping to create the International Search and Rescue Incident Database and working with the U.S. Coast Guard and other groups on search theory, Koester wanted to create a technology that could be rolled out on a much larger scale.

Bred from the SBIR program, dbS’ FIND software is the technology that powers the Lost Person Behavior App, and combines all of the features Koester originally intended to weave together. Through search theory and mapping, the software tells the user where they should be looking and how to utilize various resources, so that first responders can focus their efforts on specific areas. The software displays a heat map with the area of probability for the missing person. Using that information, an initial response-tasking algorithm map shows exactly where search teams should be tasked. This allows the power of formal search theory to be placed into the hands of initial responders with little to no formal training.

Koester adds, “Every resource is another moving piece of the puzzle to finding the missing person in the shortest amount of time. FIND has already been tested in several exercises and proved its ability to improve the search time.”

The company’s DHS SBIR work led to two Virginia Center for Innovative Technology SBIR matches worth \$100K to continue exploring the addition of UAVs to search and rescue efforts.

“So much of this work involves basic research and a lot of it involves programming, and the bottom line is there is no way this work could’ve been done without the DHS SBIR funding,” says Koester.

FIND will soon have the ability to integrate UAVs into search and rescue, planning where they should search based on search theory and documenting results. The company’s recent UAV work caught the eye of FLIR Systems, the world’s largest commercial company specializing in the design and production of thermal imaging cameras, components and imaging sensors, and the company has committed to working with dbS Productions on a large range of sensors that can fully integrate with dbS’ software.

A subsequent SBIR project with DHS S&T led to the development of the Search and Rescue Collection and Analysis Tool (SARCAT). SARCAT comes in at the end of the search. It is a web-based online data collection tool that compiles all the information on where the subject was eventually found, which resources were used, how much it cost, and other relevant information for future searches. The states of Oregon and Virginia are both SARCAT customers. dbS hopes to continue its work in the field in which it has become a worldwide leader. Koester has taken his company’s knowledge and has a goal to provide critical information in a variety of formats.