



DEPARTMENT OF DEFENSE OSD TRANSITIONS SBIR/ STTR TECHNOLOGIES "OTST" PROGRAM SUCCESS STORY

Topic #: OSD173-J02

SBIR Investment: \$1.5 million

Phase III Funding: \$4.25 million



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THE CHALLENGE

The U.S. Army issued a Small Business Innovation Research (SBIR) call in 2017 for the integration of an automatic target recognition (ATR) into small caliber/close-combat weapon systems for infantry squads. The overall goal was to detect, classify, recognize, and identify all potential targets (i.e., weapons or objects) within the engagement range of small caliber weapon systems in a variety of environmental conditions.

THE TECHNOLOGY

Leveraging deep learning and machine learning tools, OKSI developed algorithms that improved and provided real-time ATR, masking, target tracking, and masking for aim-point selection on military relevant targets ranges using mid-wave infrared / long-wave infrared / visible spectrum imagery sets. OKSI also created prototype algorithms and solutions for weapon and object detection, single frame super resolution (SFSR), human activity recognition (HAR), threat assessment, and passive ranging for the advanced fire control system (AFCT) system. The algorithms are expected to achieve high reliability with a correct detection rate of 80 percent (tracking), or 95 percent or higher (object detection) on appropriately sized objects and weapons.

THE TRANSITION

The Defense SBIR program's funding supported OKSI's effort from start to finish to create programming that fulfilled the DoD's requirements. During Phase I, OKSI used SBIR funding to research the algorithms' parameters. Under SBIR Phase II funding, OKSI developed a prototype of the algorithms to improve the targeting and detection statistics. Under Phase III, OKSI is integrating the systems into existing weapons platforms.

THE BENEFIT TO THE U.S. ARMY

OKSI enhanced their initial algorithms and implemented real-time aim-point selection and correction on an AIMLOCK small caliber weapon system in an operationally relevant scenario. These improvements enhance the lethality of Army munitions and reduce the risk to DoD personnel engaged in combat operations, while also ensuring enhanced targeting accuracy against enemy locations and interests.

THE FUTURE

OKSI's Phase III contract work will translate into support to several DoD interests, including small arms aimpoint selection for guns and common remotely operated weapon stations (CROWS), improved ATR for seekers, rockets, and other munitions, and improved targeting efficiency and lethality for next generation combat vehicles.

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