DEPARTMENT OF THE NAVY
SBIR/STTR TRANSITION PROGRAM

SUCCESS STORY

TOPIC NUMBER: N181-079

SBIR INVESTMENT: $1,999,037

PHASE III FUNDING: $3,923,873

MINEFIELD PLANNING EVALUATION AND GAMING SUITE (MPEGS)

Knexus Research is developing next generation planning tools for sensors and seabed distributed sensor deployment.

Knexus Research

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THE CHALLENGE

Current deployment of sensor nodes on the seabed is haphazard. Planning for deploying these nodes is currently done manually using rudimentary tools, which is slow and error prone. Additionally, sensor deployment models can be inconsistent and quickly become obsolete. The lack of complete and accurate models degrades the ability to plan and puts the warfighter at a disadvantage.

THE TECHNOLOGY

Knexus Research has been working over the last few years to develop planning tools for distributed sensor deployment on seabeds. The technology suite, known as the Minefield Planning Evaluation and Gaming Suite (MPEGS), uses machine learning (ML) to acquire and update performance models and perform tactical planning. This improves decision support provided by automated mission planning systems in dynamic environments, such as the seabed. With this technology, the Navy can take ship information, global environment information, and sensor characteristics to determine where sensors should be deployed. This evolution in deployment allows sensors to be delivered by manned and unmanned surface and subsurface craft.

THE TRANSITION

Knexus' MPEGS algorithms and software evolved from an SBIR Phase II award under topic N181-079 titled "Continuous Interactive Learners for Mission Planning (CILEMP)." The Office of Naval Research awarded a Future Naval Capabilities (FNC), and a Phase III contract to extend and further develop this technology for sensor deployment. FNCs demonstrate a system, associated training, or tactical decision aids in relevant operational environments in partnership with OPNAV resource sponsors and acquisition program managers.

THE NAVAL BENEFIT

Knexus' technology allows the Navy to use fewer sensors for the same effectiveness. This significantly decreases the cost of deployment. The tool also substantially decreases the operator burden and amplifies their decision-making ability when planning and deploying high performance sensors with unique characteristics. This enables and improves the sustainment of naval activity with existing personnel, allowing them to do more. Additionally, the Knexus technology makes performance of the sensor fields more effective, providing increased situational awareness of the seabed environment, and ship traffic in the areas where the sensors are deployed.

THE FUTURE

As part of ONR's FNC program, Knexus' technology is a candidate to be integrated into tools for expeditionary warfare.

> **"Knexus Research Corporation has performed excellent work developing algorithms to reduce planner burden and increase relative effectiveness of these sensor fields, and we hope these algorithms will make a broader impact on our mission area."**
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> Dr. Matthew Bays , ONR Future Naval Capabilities Product Lead, Naval Surface Warfare Center, Panama City Division