



Advancing Naval Operations with AR, Multi-Sensor Integration, and AI-Based Detection

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Opportunity: Naval Postgraduate School



This summer I worked on three projects to improve Navy operations using different technologies. The first focused on augmented reality (AR) training for additive manufacturing, creating step-by-step modules with Taqtile Manifest and AR headsets to help sailors learn 3D printer operations and maintenance with minimal prior training, reducing downtime and costs. The second developed and tested a passive, multi-sensor unmanned aerial system (UAS) detection setup for maritime special operations platforms, integrating EO/IR, RF, acoustic, and radar sensors without active RF emissions, along with Python tools for data

processing and field testing. The third, Night Vision Drone Detection, tested over 24 deep learning-based image restoration models for low-light object detection, finding that SRMDx2 'dn' plus DarkIR preprocessing significantly improved YOLOv11's accuracy over original images. Together, these projects highlight how technology can address real challenges in Navy environments, completed as part of the STEM internship program at NPS.

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