

## Development of Intelligent Sensors for Combating Terrorism

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The increased threat of international terrorists using chemical and biological weapons of mass destruction, has led to a significant effort to develop tools to detect and effectively combat biochemical warfare. There is heightened awareness that chemical and biological agents (CBAs) are cheap alternative weapons, which attack large populations, leaving infrastructures intact. Despite availability of numerous sensing devices, intelligent hybrid sensors that detect and degrade CBAs are virtually nonexistent. This paper reports the integration of multiarray sensors with support vector machines (SVMs) for detecting organophosphates nerve agents using parathion and dichlorvos as model simulants compounds. SVMs were used for design and evaluation of new, more accurate classification software. Experimental results, using Structural Risk Minimization, show a significant increase in classification accuracy, compared to an existing baseline system. For example, there is a 168% specificity improvement and a 40.5% improvement using the s2000 kernel at 100% and 98% sensitivities compared to Aromascan.

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