

1046-M1-1805 **Joni E. Baker*** (joni@va.wagner.com), Daniel H. Wagner Associates, 2 Eaton St., Suite 500, Hampton, VA 23669-4054, and **C. Allen Butler, W. Reynolds Monach** and **Thomas R. McSherry**. *Automated Torpedo Classification and Alerting Using Bayesian Methods*.

In this talk, we describe the use of advanced and automated Bayesian inference techniques used for target classification and prioritization within Daniel H. Wagner Associates' Anti-Torpedo Data Fusion and Optimization System (ATDOS), which we are developing for the Office of Naval Research. The ultimate goal is to utilize all relevant fused acoustic and non-acoustic sensor data to reduce the false alarm rate drastically, while maintaining a high probability of detecting any incoming threat torpedoes in a timely manner. Broadly speaking, the classification/prioritization process involves two main steps: first, our Non-Gaussian Data Fusion System (NGDFS) combines the available sensor data (e.g., active/passive sonar, radar, electro-optical) to form tracks, along with their associated kinematic and non-kinematic feature estimates. Then, our Bayesian Inference Engine (BIE) uses these feature estimates, as well as the associated sensor data, to calculate the probability that each track is a torpedo. In this talk we will focus on the BIE, the underlying Bayesian Network for ATDOS, and the logic by which evidence is incorporated therein. We will also provide an analysis of the ATDOS's performance during a very successful live torpedo demonstration which took place in January 2008. (Received September 16, 2008)