

1. **Research Title:** “Radar Signal Processing using COTS Computer Architectures”
2. **Individual Sponsor:**
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3. **Academic Area/Field and Education Level:** Electrical Engineering / Applied Mathematics (MS or Ph.D. level)
4. **Objectives:** The objective of this research is to develop fast, efficient, and cost effective implementations of radar signal and image processing algorithms on state of the art Commercial Off The Shelf (COTS) hardware for potential application to future radar systems.
5. **Description:** Significant advances are being made in the development and manufacture of processor architectures for a variety of applications including video gaming and wireless communication. Processors such as the IBM Cell-B and others are very affordable and very capable and may be excellent candidates for future radar signal and image processing applications including channel equalization, motion compensation, adaptive filtering, thresholding, image formation, and tracking. Their extremely low cost, commercial availability, low power consumption, small size and weight, programming ease and significant computational capability make them very attractive options for military use. This research topic will focus on the analysis and decomposition of selected radar signal and image processing algorithms and their implementation on selected COTS computer architectures to assess the utility of such architectures in future radar systems for uninhabited aircraft and space systems applications.
6. **Research Classification/Restrictions:** This research could be conducted at a variety of classification levels, including unclassified investigations.
7. **Interest in Summer USAFA Cadet (Avg Cost for USAF Cadet for 33 days was \$4000):** A USAF Cadet could be sponsored in the summer of 2008, as this topic is highly relevant to emerging Air Force capabilities.
8. **Eligible Research Institutions:**
 Universities (DAGSI) AFIT (only) USAFA