Forward: Generative Artificial Intelligence

The DAF SAB study on Generative Artificial Intelligence (GenAI) addresses the potential impact and promise of GenAI on the DAF. This is a "quick look" study designed to review material and prepare a report of findings and recommendations in a short period of time. These technologies leverage the transformational power of self-supervised learning to dramatically increase the amount of training data used and the size of models created. At the same time, this approach reduces the costs in human time to label data, and in the funding required to get that data labeled. The result are tools that can generate text and images that are surprisingly effective at performing well on many standardized tests, but which are not yet consistent with DoD's published Ethical Principles for Artificial Intelligence.

The study panel consisted of SAB members, consultants who bring specialized expertise in GenAI, DAF military personnel from the DAF CDAO, DAF-MIT AI Accelerator, and the AFRL. It also included executive officers chosen for their personal expertise in the area to support the study. The panel reviewed the state of the art in GenAI recognizing that the field is advancing rapidly – indeed during the three months of the study from inception to conclusion, new information became available that resulted in weekly reading assignments for the panel. The panel met with commercial and academic practitioners once a week from April-May to level set the panel's understanding of both the current state-of-the-art but also expectations of the near future for GenAI. Finally, the panel met in-person at Joint Base Andrews, MD in June 2023 to receive information from DAF and DoD organizations, to deliberate on findings and recommendations and to prepare study deliverables.The SAB recommends the DAF:

• Conduct a pilot to demonstrate the potential of GenAI for routine business operations. Airmen and Guardians must regularly consult published standard procedures with page counts in the thousands. GenAI can be used to simplify the generation of plans for training and operational uses. Commercially hosted, cloud based, GenAI tools can be used to explore capability and costs and the DAF and contractor can learn how to address ethical AI issues.

• Conduct a pilot study of GenAI for operational use. An example of a pilot is the use of GenAI in the creation of intelligence products. This will require hosting a GenAI model on computing systems approved for classified work at the appropriate level. We recommend using an available foundational model and tuning it with DAF-specific data, exploring functionality, costs, and ethical AI issues with this toolset.

• The DAF will need to grow and manage a GenAI-relevant talent workforce. Essential is the need to better identify positions requiring these skills and personnel with the necessary training, considering recruiting, upskilling, and retaining personnel.