Getting Started with AIR

Would your program benefit from being an AIR partner?

THE SOFTWARE ENGINEERING INSTITUTE (SEI) IS CURRENTLY SEEKING PARTNERS to deploy our prototype Artificial Intelligence Robustness (AIR) Tool. As part of a funded research project, we are seeking to work with a small number of organizations to explore the usability and effectiveness of the AIR Tool and gather user feedback that will be useful for practitioners in the future.

What Is AIR?

Modern analytic methods, including artificial intelligence (AI) and machine learning (ML) classifiers, depend on correlations; however, such approaches fail to account for confounding in the data, which prevents accurate modeling of cause and effect and often leads to prediction bias. The AIR Tool is built to detect confounding bias, and allow for its removal, via causal discovery and identification using data about variables along those confounding paths. The SEI developed the AIR Tool to allow users to gauge the performance of AI and ML classifiers with unprecedented confidence.

Benefits to Partners

Teams that are currently relying on classifier models to make business decisions can benefit from applying the AIR Tool. AI and ML users who are struggling to validate the output of classifier models can use the AIR Tool to understand the attribution of outliers and causes. The tool can provide users insight into how to achieve less biased and more suitable results that can be trusted to guide intervention and control of a system's performance.

Organizations that partner with the SEI team should expect to

- gain custom insights and recommendations on how to improve AI and ML classifiers
- improve the performance of AI and ML classifiers and subsequently impact results and support the mission
- obtain data-driven confidence in the robustness of the existing AI or ML classifiers
- enhance partner staff's capability with and understanding of AI classifiers
- receive assets for training and custom tool support for ongoing use
- become innovators in this domain by contributing to the state of practice across the Department of Defense (DoD)

Partner Contributions

The SEI will ask partners to

- field the AIR Tool with AI or ML classifier and rich observational datasets
- work with the SEI on adopting the AIR Tool
- validate the efficacy of the AIR Tool
- provide feedback that leads to adaptation of the tool for broader DoD adoption

Partners are not required to provide the SEI with access to or ownership of the data or AI and ML models.

The cost to the partners will only be the investment of staff effort for the partnering activities.

Prerequisites

To participate in the AIR pilot program, your organization should

- use an AI or ML classifier and predictor
- have subject matter experts (SMEs) on your AI or ML model(s) and dataset who will participate in discussions
- be willing to consider updates to your AI and ML classifier(s) based on the AIR Tool results and provide feedback to the SEI

Working with the SEI's AIR Team

When a partner is identified, the SEI will hold a kickoff meeting with staff involved in developing, maintaining, and using their AI and ML model(s). After this initial deep dive into how to use the AIR Tool, we will work with the partner team to plan key milestones and tasks for adopting the AIR Tool.

After providing the AIR Tool, the SEI will then hold working sessions with appropriate technical staff to assist in the installation and use of the tool. Working sessions will focus on topics such as scenario and data preparation, tool application, and interpretation of results. Partner mission data and classifier SMEs can engage with the SEI throughout this process. We will also provide informal training and support throughout the partnership. The length and frequency of working meetings will be agreed upon to meet the partner's needs and will be dependent on the availability of the partner and the SEI SMEs.

At each stage, the SEI will also ask for regular retrospective meetings with the team working with the AIR Tool to get feedback on the installation of the tool, tool usage, applying the results from the AIR Tool, the perceived value of the AIR Tool, and other topics. This feedback from the partner is critical to achieving the goals of the SEI research project and for guiding improvement that will benefit future AIR Tool users. Partners will contribute to the SEI's AIR Tool evaluation report, which will summarize the experience using the AIR Tool and offer recommendations.

As part of the SEI's empirical research approach, it is important for us to have access to SMEs for feedback regarding the outcomes of applying the AIR Tool. Partners' lessons learned will inform the supporting documentation and functionality of future iterations of the AIR Tool.

Variations to this working model will be considered.

About the SEI

Always focused on the future, the Software Engineering Institute (SEI) advances software as a strategic advantage for national security. We lead research and direct transition of software engineering, cybersecurity, and artificial intelligence technologies at the intersection of academia, industry, and government. We serve the nation as a federally funded research and development center (FFRDC) sponsored by the U.S. Department of Defense (DoD) and are based at Carnegie Mellon University, a global research university annually rated among the best for its programs in computer science and engineering.

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