

NOTE: Under the Cooperative Agreement, Technical Directorates have three options for topics. First, a topic can strictly be considered in the pool for the state allocation of funding. DAGSI will work across the TDs for this allocation. Second, the TD can be prepared to be a funding partner with the State of Ohio. This would include: providing additional funds to support additional recipients of a topic, or expand the proposers team to include additional members on a topic. Third, the TD may elect to fully fund a topic not selected for State of Ohio funding or to pursue University teams outside the State of Ohio. Contact lindsay.kotouch.2@us.af.mil for questions.

- 1. Research Title:** Computationally Efficient AI/ML Enhanced DOA-based Geolocation
- 2. Individual Sponsor:**

Dr. Jacob Compaleo, AFRL/RYPMP
AFRL/RYPMP Bldg 620
2241 Avionics Circle
WPAFB, OH 45433-7333
jacob.compaleo@us.af.mil

- 3. Academic Area/Field and Education Level**

Electrical Engineering (MS or PhD level)
Computer Engineering (MS or PhD level)

- 4. Objectives:** Utilize advances in artificial intelligence (AI) and machine learning (ML) to develop a new computationally efficient direction of arrival (DOA) based geolocation technique that outperforms current state of the art techniques.
- 5. Description:** Conventional single-platform geolocation is often accomplished using DOA estimation algorithms. Single-platform geolocation mitigates multi-platform geolocation issues such as time synchronization between platforms but suffers poor geolocation accuracy compared to the multi-platform scenario. AI/ML advancements have dominated the geolocation literature in recent years. These techniques have been shown to significantly improve geolocation accuracy compared to conventional methods. Despite these advances, one glaring weakness to these advanced techniques is their lack of practicality. The extensive training and building of libraries required for AI/ML approaches hinder their use in real-world applications. The goal of this work is to develop a novel AI/ML enhanced single-platform geolocation algorithm with geolocation accuracy similar or better than current state of the art techniques and improved computational efficiency.
- 6. Research Classification/Restrictions:** unclassified
- 7. Eligible Research Institutions:** DAGSI-SOCHE members

Distribution Statement A: Approved for public release. Distribution is unlimited. AFRL-2024-4770