Swarm and Search AI Challenge: 2019 Fire Hack

Team AM²X from ACIT Institute represents NC A&T State University

The US Air Force Research Laboratory (AFRL) in collaboration with the Wright Brothers Institute (WBI), the UK Defence Science and Technology Laboratory (DSTL) and the University of Dayton Research Institute announced the Swarm and Search AI Challenge in early January. AFRL and DSTL are utilizing this innovative approach to find the best artificial intelligence algorithms that embody efficiency and resiliency. The competition, which began in February, aims to explore new and more efficient ways to plan challenging Unmanned Aerial Systems (UAS) missions. Teams will compete against each other in the US and the UK, during a final showdown on March 29-31, 2019 in Dayton, OH. North Carolina A&T State University (NC A&T) Autonomous Control and Information Technology (ACIT) Institute is one of those registered teams for this challenge. The ACIT team, led by Dr. Abdollah Homaifar, is comprised of one Post-doctoral research associate, Dr. Berat A. Erol, along with one Master's and two PhD students.

The Swarm and Search AI Challenge: 2019 Fire Hack competition aims to find new, efficient and resilient ways to plan complex UAS search and rescue missions. Fire maps are the crucial component in mitigating the risks in the wildfire season. The focus of the challenge revolves around mapping wildfires and assumes that improved mission planning and the ability to react to dynamic changes, has the potential to minimize damage and save lives. However, the solutions created may also apply to defense applications.

With a focus on optimized mission planning and the ability to react to dynamic changes, competing teams will work on an online collaboration platform to explore different fire-map scenarios by using U.S. Air Force-licensed software. The first stage was a basic test to get the teams familiar with the AFRL software and the competition. The second scenario is more challenging with dynamic simulation attributes, including instant changes on natural factors that the simulation environment will adapt to accordingly. The scenarios will get more difficult as the challenge goes towards the final showcase.

The Top 10 teams selected will move forward to the international stage, *the showcase* that takes place on March 29-31, 2019 in Dayton, OH. The NC A&T team is among the top five teams of all participants nationwide based on the scores from the first two stages of the challenge. Our teams is invited to attend the upcoming showcase and is granted $5,000 in cash, and the travel expenses will be covered up to another $5,000. The top three teams from the next challenge will be awarded additional cash prizes. The highest scoring solution will be introduced at the 2019 AUVSI Conference and the U.K. Embassy Showcase in Washington D.C.

Team AM²X Members:
Dr. Abdollah Homaifar, Team Leader
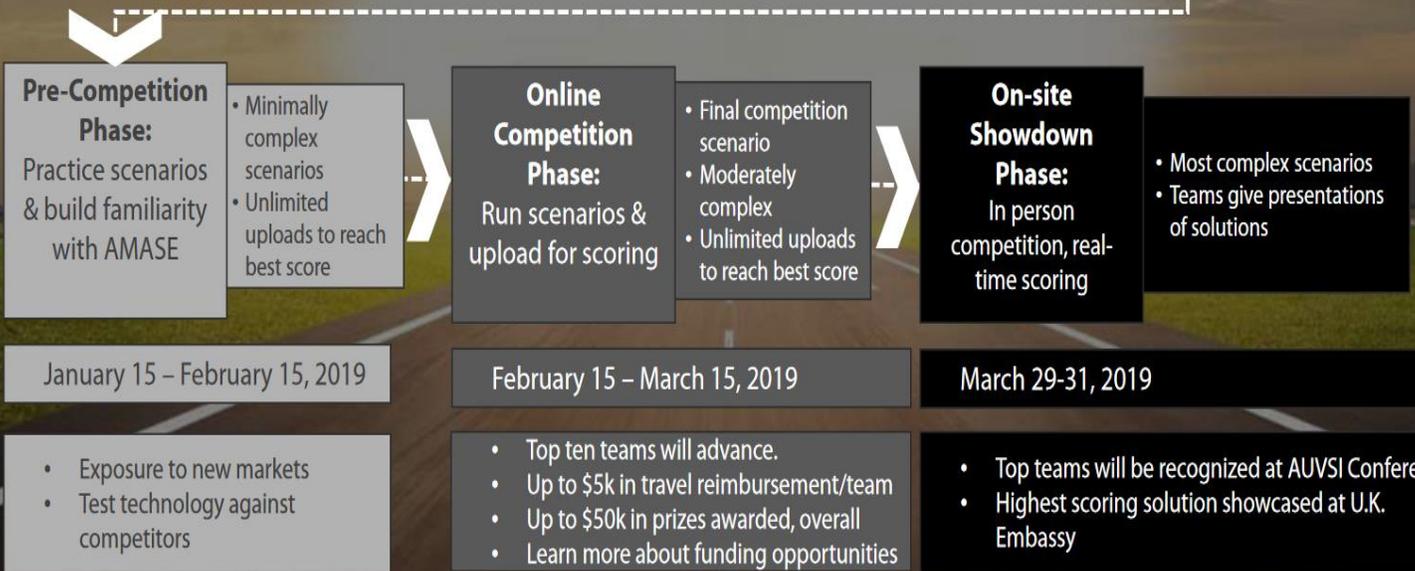Dr. Berat A. Erol, Team Member
Ms. Mikol Forney, Team Member, MSc Student
Mr. Mrinmoy Sarkar, Team Member, PhD Student
Mr. Xuyang Yan, Team Member, PhD Student
Mr. Mohammadreza Behniapour, Team Member, PhD Student

QUICK START GUIDE
SWARM & SEARCH AI CHALLENGE

START HERE

Register Online
(lead must be U.S. citizen)

Team lead completes & returns software license

Teams invited to register with APAN

Teams download AMASE software, Scenarios

Pre-Competition Phase:
Practice scenarios & build familiarity with AMASE

- Minimally complex scenarios
- Unlimited uploads to reach best score

Online Competition Phase:
Run scenarios & upload for scoring

- Final competition scenario
- Moderately complex
- Unlimited uploads to reach best score

On-site Showdown Phase:
In person competition, real-time scoring

- Most complex scenarios
- Teams give presentations of solutions

January 15 – February 15, 2019

February 15 – March 15, 2019

March 29-31, 2019

- Exposure to new markets
- Test technology against competitors

- Top ten teams will advance.
- Up to $5k in travel reimbursement/team
- Up to $50k in prizes awarded, overall
- Learn more about funding opportunities

- Top teams will be recognized at AUVSI Conference
- Highest scoring solution showcased at U.K. Embassy