Q&A Session

November 16, 2022

1:00-2:30 PM EST

Website: FAAdatachallenge.nianet.org
Email: FAAdatachallenge@nianet.org

PLEASE MUTE ALL MICS

Agenda

- Welcome & Introductions
- 2023 FAA Data Challenge Overview
- Programmatic Questions
- Technical Questions
- Open Mic Additional Questions (Time Permitting)
- Wrap Up

Welcome & Introductions

NIA & FAA PROGRAM TEAM

- Natesh Manikoth, FAA Chief Data Officer
- Marseta Dill, FAA Deputy Chief Data Officer
- Shelley Spears, NIA Challenge Program Director
- Shannon Verstynen, NIA Challenge Program Manager
- Laz Bosch, NIA Challenge Project Coordinator
- Peter McHugh, Director of FAA-NIA Programs

STEERING COMMITTEE

- Gian Burdhimo, FAA Air Traffic
- Jeff Carter, FAA Safety
- Dr. Misty Davies, NASA
- Marseta Dill, FAA Deputy Chief Data Officer
- Gabriel Elkin, MIT Lincoln Laboratory
- Brian O'Donnell, Volpe
- Mike Paglione, FAA Next Gen
- Dr. Craig Wanke, MITRE

Challenge Overview

The 2023 FAA Data Challenge focuses on the use of Artificial Intelligence/Machine Learning (AI/ML) and advanced analytics to address aviation-related problems and opportunities. AI/ML is rapidly transforming many industries including aviation.

DESCRIPTION

The FAA seeks submissions that will push the boundary and introduce novel approaches to aviation problems as the FAA moves further towards an info-centric National Airspace System (NAS). The advanced analytics and AI/ML proposals should address one of the following categories:

IMPROVE AVIATION SAFETY

- We are striving to be even smarter about how we enhance safety. By gathering and analyzing operational data, we can identify and address potential hazards and mitigate issues before they occur. AI/ML and big data can be used to identify trends, correlate events, predict outcomes, and move us closer to in-time analysis of safety of the overall system.
- We also want to investigate how operational performance of the aircraft data could be collected for Part 91 (General Aviation) and similar operation types (e.g., using mobile application streaming data to the cloud or automated upload at base/service intervals) and used to identify safety issues, deviations, and enhance accident investigations. This capability is beneficial for aircraft that do not have a requirement for a flight data monitoring program (FDM).

IMPROVE OPERATIONAL EFFICIENCY OF THE NAS

- By sharing of real-time data about weather, the location of aircraft, and conditions throughout the National Airspace System, we can improve the operational efficiency. When we get the right data to the right people at the right time, we can make better decisions and use of available airspace and airport capacity.

CONTRIBUTE TO THE DRIVE FOR SUSTAINABLE AVIATION

- Sustainable aviation will require progress along multiple dimensions; from sustainable fuels, improving operational efficiency, building the next generation aircrafts to minimizing environmental and social impacts; every aspect will be improved by advances in analytics.

ASSIST WITH THE RAPIDLY EVOLVING NEW AND NOVEL USES OF THE NAS

- There is tremendous growth in the aviation field, including demand for commercial and private services and new aircrafts being introduced. Leveraging modern analytical techniques (e.g., modeling, simulation) can allow us to rapidly simulate operational scenarios to evaluate risks and optimize operations.

PROGRAMMATIC QUESTIONS

Programmatic Questions

- Is it possible to access successful competition submissions from previous years to learn from past student work?
  - This is the FAA's first Data Challenge. In previous years, other challenges have been conducted with a different focus to include Smart Connected Aviation and Smart Airports -- examples from previous successful teams of the FAA Challenge are available on the website, https://faachallenge.nianet.org (2020 and 2021 are listed under the "Archives" tab). The FAA has also partnered with universities through the federally funded research. Participants are encouraged to explore past projects archived in the technical library, https://www.faa.gov/about/office_org/headquarters_offices/ang/library.
- Are you open to reconsidering the potential participation of non-US persons? Given that this is a data science challenge and a very large percentage of our students are not US citizens/residents, it would make a lot of sense to include them in the challenge.
  - At this time, non-US citizens/residents are not eligible to participate. The FAA will take this feedback and explore whether this is a possibility for future challenges.

TECHNICAL QUESTIONS

Technical Questions

- I have a question regarding the data and datasets that we can have access to. One of our team's potential ideas is to use ACARS data files to develop an AI system that can be used for hazard identification and prediction. However, we were wondering if you can help us find sample ACARS data files that contain operating APU data such as load compressor inlet temperature, load compressor discharge temperature, oil temperature, exhaust temperature, etc. We have been able to find some ACARS dataset from https://data.eol.ucar.edu/cgi-bin/codiac/fgr_form/id=100.016, however it seems like the files only contain meteorological data.
    - Other datasets may be found on the FAA Data Portal, Data & Research site, and Sherlock Data Warehouse (see links on Resources page of website). We encourage teams to research and include in your Abstracts, then reach out to us again with specific data assets that are of interest to your team.
- Will any datasets be provided to train/validate potential ML algorithms? If not, what are some recommended public/freely available datasets?
    - There are several datasets that are publicly available. We can work to provide a list and the location where the data is available. Examples: FAA Accident/Incident Database (AIDS), Service Difficulty Reporting System (SDRS), NTSB (authoritative source of aviation accidents and incidents), etc. FAA will gather resources and share directly with this team soon.

LIVE QUESTIONS

Timeline

Oct 17 – Challenge Announced

Jan 24-Feb 23 – Judges review and evaluate Abstracts

May 8-June 20 – Judges review and evaluate Technical Papers

Nov 6 – EOI Deadline

Nov 9 – Deadline to submit questions

Nov 16 – Q&A Session #1

Jan 18 – Q&A Session #2

Jan 22 – Abstract Deadline

May 7 – Technical Papers Due

Feb 28 – Finalists announced

June 21-22 – Challenge Forum

Mar 1- May 7– Finalists work on Technical Papers

May 8 – June 20 – Finalists work on Presentations

Abstract Evaluation & Criteria

- **Approach = 40%**
  - Do significant aspects of the proposed concept directly address the theme?
  - Has the submission proposed a logical ad workable solution and approach to solving the problem(s)?
  - Has the team provided details that identify how the improvements, changes, and/or related activities of the proposal can be implemented in a practical manner?
  - Has the submission clearly described the depth of integration required to implement the innovation, idea, or proposed concept?
- **Need = 25%**
  - Has the submission presented a clear understanding of the associated problems being addressed?
  - Has the submission clearly defined the direct beneficiaries of this concept and the breadth of impact of the various components of the innovation? Has the submission provided details identifying how the concept directly provides a benefit?
  - To what extent does this project have the potential to make a significant impact and/or contribution?
- **Benefit = 25%**
  - Has the submission provided information on how likely the concept will be accepted and easily used?
- **Originality = 10%**
  - To what extent is this concept new, or in what way is this an innovation on an existing idea?
  - How is this concept unique?
  - How did the team members' experiences inform the proposed concept?

Prizes & Travel Reimbursements

TRAVEL

- Ten Finalist teams will be invited to present at the Forum in Washington, DC metro area
- Each team will be reimbursed up to $8,000 to offset travel costs

PRIZES

- $10,000 goes to the university of the top three winning teams
- Additional $15,000 goes to the university of the Grand Prize winner
- All Finalists receive Certificate of Achievement

2023 FAA Data Challenge Forum

June 21-22, 2023

Washington, DC metro area

Questions?

Please send all future questions to FAADataChallenge@nianet.org.

Each question will be responded to directly and posted on the FAQ web page for everyone to see.

We encourage you to visit the Challenge website frequently for updates:

https://faadatachallenge.nianet.org/