TECHFEST 2022-23
WeldRight

INTRODUCTION

Godrej & Boyce Mfg. Co. Ltd. (G&B), the flagship Company of the Godrej Group, has played a key role in India's economic history by driving excellence in design and manufacturing and delivering sustainable value for its stakeholders and communities. G&B's diverse presence across 10 industries — from complex engineering solutions to consumer goods like appliances, furniture and security solutions - positively impacts the lives of one-third of India's population daily. From healthcare to infrastructure, G&B has been committed to nation-building from its very inception, back in 1897. The company's products have established a strong global footprint across 5 continents through international subsidiaries and joint ventures.

BACKGROUND

Godrej Aerospace (GA), a strategic business unit of G&B engages in hi-tech aerospace manufacturing activities. Our foray into aerospace activities started in 1985 with the development of critical, high-precision spacecraft components, made from exotic alloys. Currently, we are executing major projects which serve the Defence, Space and Aircraft segments.

Welding is an important and critical activity for the manufacturing activities of Godrej Aerospace. In this field, welding involves metals like titanium, aluminum & its alloys. The threshold for welding error is the bare minimum.

PROBLEM STATEMENT

Participants are expected to use ML models to predict welding defects in the materials by developing algorithms using the provided parameters. Participants are free to use any technique provided it is suited for the variety and volume of data provided.

The end goal of this competition is to enable the Godrej Aerospace team to produce defect-free products every time.

DATA PROVIDED

We have identified multiple parameters affecting the welding process and recorded the dataset from past activities. Process parameters such as ambient temperature, weld job temperature, humidity, voltage current, welding travel speed, shielding gas flow, and metal composition. For advanced analytics machine data, welder details are provided.

JUDGING CRITERIA

Participants will present a working version of their system and engage with a team of experts in explaining their solutions and choices.
Sample data points will be provided to all participants a day before the presentation.

Judging will be based on:
- Effective output of the algorithm to predict defect before it occurs as per the input parameters
- Advanced analytics on welder performance, machine utilization, etc.

Bonus points for
- Return on investment (ROI) calculations
- Total cost of ownership (TCO) calculation.

STRUCTURE

Round 1: Abstract submission

Participants have to submit a proposal (not to exceed 3 pages) based on the work done so far and also a survey of relevant techniques. It should also include the approach they are using along with its explanation.
Top 25 teams would be shortlisted for Round 2

The last date for Round 1 Submission is **16th October**

Round 2: Final Submission and Presentation at Techfest

During this phase, the top 25 teams would be given time to refine their model and upload the results. It would be compared against the test data held back and a ranking of participants would be generated based on the accuracy achieved. **Mean absolute percentage error (MAPE)** would be used for evaluating model performance.

The top 10 teams from this phase would be shortlisted for their final presentation at Techfest, IIT Bombay (provided they suffice a minimum scoring criteria which will be decided by judges). A minimum threshold of **F1 score > 0.8** has to be fulfilled by the teams.

The top 10 teams would be given time to present their final model. Participants must prepare a brief presentation that summarises their model. Your model would be judged on the originality, effectivity and scalability of your approach. Evaluation of round 2 would be based on **60% model performance and 40%** on the scores of the Judges' Panel.

The last date for Round 2 Submission is **30th November**
Top 10 teams will present their solution in **Techfest**, IIT Bombay from **16th-18th December**

TIMELINE

Session from Godrej experts	6th Oct @6pm- 1hr slot
Last date of registration	15th October
Round 1 Submission deadline	16th October
Round 1 results announcement	22nd October
Round 2 Submission deadline	30th November
Final presentation	16th-17th December
Winners announcement	17th December

GENERAL RULES

- Every team has to register online on the Techfest website for the competition. A Team ID will be allocated to the team on registration which shall be used for future references.
- A team can register at any point of time before **16th October** and submit the final abstract and video (as mentioned in the structure).
- The decision of the organizers and/or judges shall be treated as final and binding on all.
- Techfest has all the rights to verify the identity and accuracy of the details provided by the participants.
- Techfest, IIT Bombay will hold no responsibility for any late, lost, or misdirected entries.
- The idea presented by the teams should be original (not protected by patent/copyright/technical publication by anyone else).
- Note that at any point in time the latest information will be that which is on the website.
- All modes of official communication will be through the Techfest e-mail.

TEAM SPECIFICATIONS

- A team may consist of a maximum of 4 members.
- Students from different educational institutes can form a team.
- All students with valid identity cards from their respective educational institutes are eligible to participate.

CERTIFICATE POLICY

- Shortlisted teams for the finals which also give a final presentation about their work during Techfest 2022-23 would be awarded an e-Certificate of Participation.
- The top 3 teams after the final result declaration would be provided with an e-Certificate of Excellence.

PRIZE MONEY

The prize money will be awarded to the top 3 winners via NEFT and will be processed within 30 working days after receiving the prize money from sponsors. The top 10 teams will get a certificate of excellence. Winners have to mail their bank details (immediately after the announcement of results) to abhishek@techfest.org in the format specified below.

FORMAT OF MAIL

Subject: WeldRight, Team_ID, Position (example: WeldRight, WR200468, 2nd Position)

Body of mail:
Account Holder's Name
Account Number
Bank name and Branch name
IFSC Code
Photograph of Bank Passbook as a proof