Summer Internship Report-Out

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Agenda

1. Introduction
2. Main Projects
   - CRACKEN Overview:
     - CRACKEN Desktop
     - CRACKEN Playback
   - DBGET API Tool
3. Takeaways
4. Feedback

About Me – Paul Abdelmessih

Personal

Born: Cairo, Egypt
Hometown: Nashville, TN

Education

Vanderbilt University
B.S. Mechanical Engineering &
Minor in Computer Engineering, 2023

Experience

Internships – GE Power Clearance Team Intern

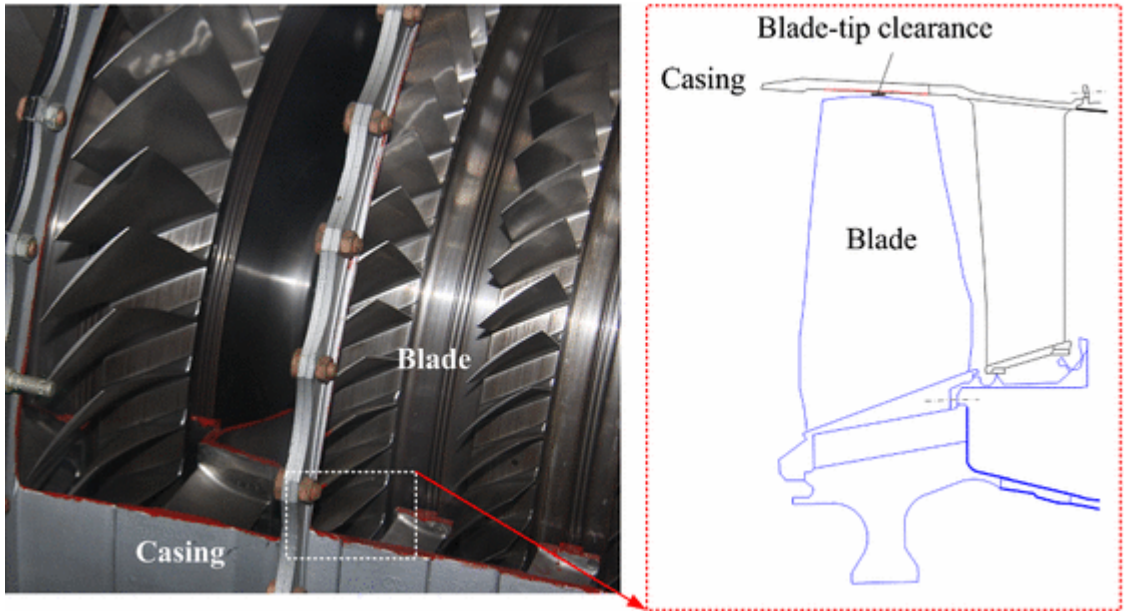
School Projects – Race Car, Grappling Hook Gun, Automated Security System, Line Following Robot, etc.

CRACKEN Overview

Background

- Computational Real-Time Analysis for Clearances Knowledge and EstimatioN or CRACKEN is a mathematical model.

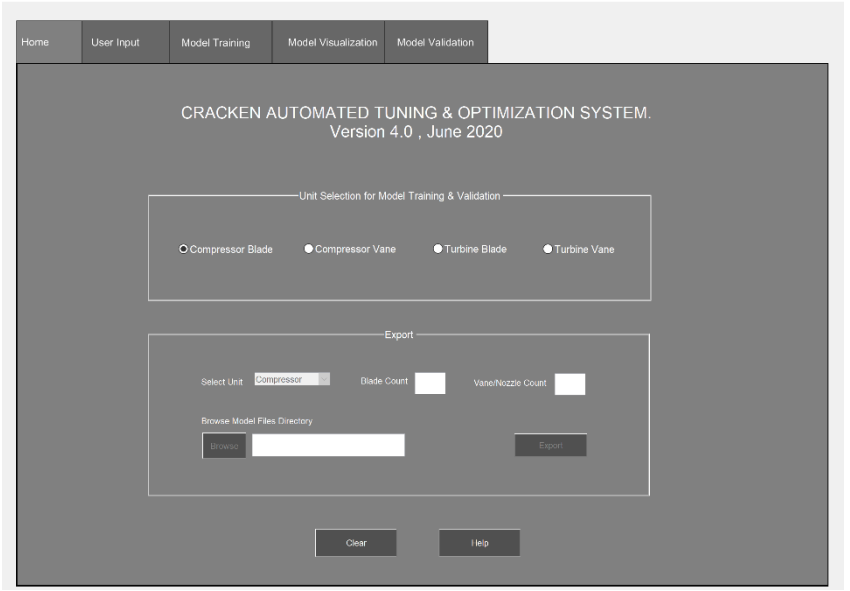
- Goal of CRACKEN is to predict the temperatures of the rotor and casing after a shutdown.

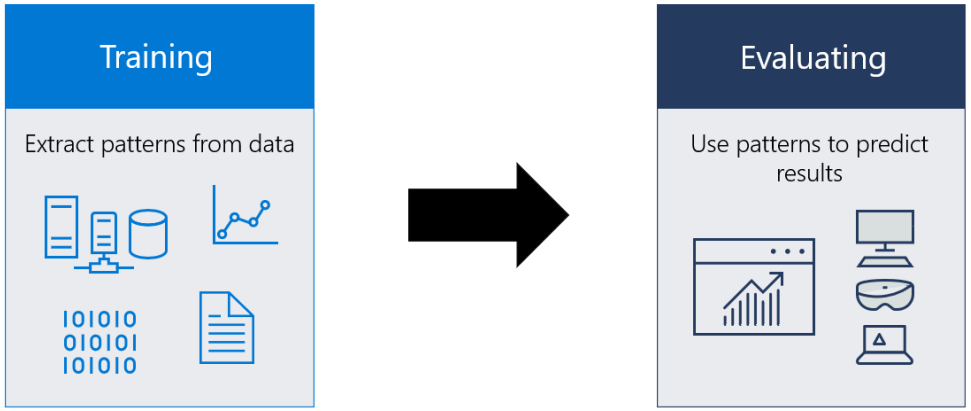


CRACKEN Desktop

- CRACKEN Desktop is a tool that trains a model using a small number of missions (3-5) that have been ran through traditional Heat Transfer and clearance rollup processes.

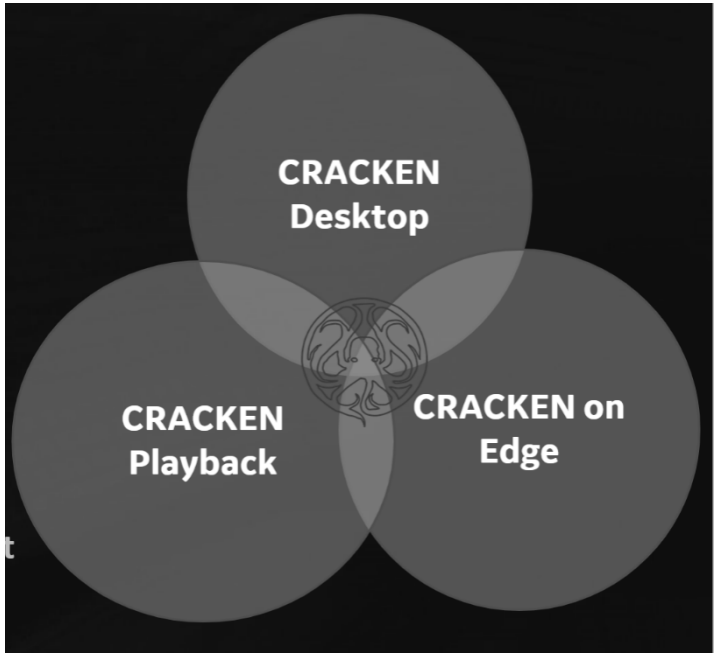
- As part of the CRACKEN team, I used CRACKEN Desktop to train a model.





CRACKEN Playback

- CRACKEN Playback is the Digital Twin model in an emulator application that is used during test runs to predict clearances.
- I helped with pre-processing and post-processing data for CRACKEN Playback.

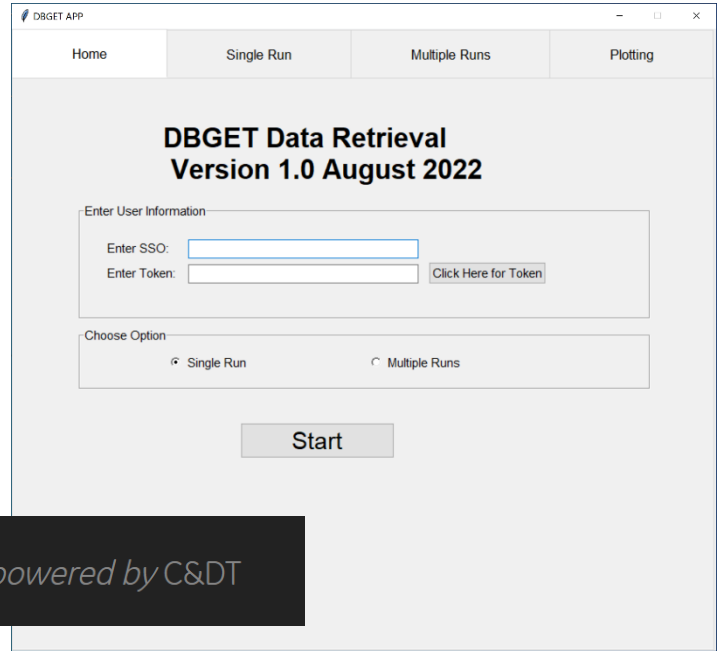


Takeaways

- Clearances are an important aspect of the compressor and turbine efficiency and overall functionality.
- Understanding clearances real-time to balance restart availability versus rub risk which enables profit and resource maximization.

DBGET API Tool

- Developed and created a fully-functional Graphical User Interface (GUI) tool that retrieves data from the Testman Store or DBGET, which contains all the test run data used by GE. This tool makes the process of retrieving the data much faster and easier than the other alternative.
- This tool is also able to plot up to 20 plots simultaneously of different configurations chosen by the user. This allows for automated post-processing
- Main goal of the tool is to integrate the entire journey of the data from pre-processing to post-processing



Testman Store *powered by* C&DT

Takeaways

- Learned the importance of post-processing data to allow for better evaluations and communication.
- Efficient tools can save time and effort for the user that can be then used to better process the data.

Big-Picture Takeaways

Lessons Learned:

- Taking initiative is a huge part of the job and can lead to opportunities that are otherwise missed.
- First attempts are never perfect
- Asking for feedback and input from team members is essential in any project and a second set of eyes never hurts.
- Communicate with team members, ask for help early on.
- Don’t be afraid to ask questions.

Feedback

Continue

- Creating a great learning environment that fosters curiosity and engagement.
- Team involvement and encouragement
- Providing tours led by team members to help interns explore more of GE.
- Frequent inclusion in everyday engineering discussions and meetings to allow for more hands-on learning

Consider

- Allow for interns to do more “independent” work
- Creating a guide for interns/new hires on their position and relevant information they need to know.