

SUPERVISOR: Ir. Roberto Suarez Raspopov

Background:

During this internship project, the student will develop numerical skills and learn to use several software tools for gas turbine simulation.

A number of gas turbine simulation tools are currently available at Inholland. For example, the commercial software packages GSP and Gasturb, and the West CS BV test bench manufactured by Price Induction. Furthermore, Inholland has been recently in contact with the Polytechnic University of Montreal which offered the free use of their MDIDS gas turbine simulation tool. In the previous semesters, various students have done projects within the GT simulation field and their results are currently being used to design a “Gas Turbine Simulation” course for the Gas Turbines minor 2019.

The purpose of this internship project is to further develop the in-house gas turbine simulation capabilities. The results of this internship will be used to improve the propulsion education at Inholland by creating new practical assignments for students and new educational materials. The student will compare the capabilities/interfaces different software packages available.

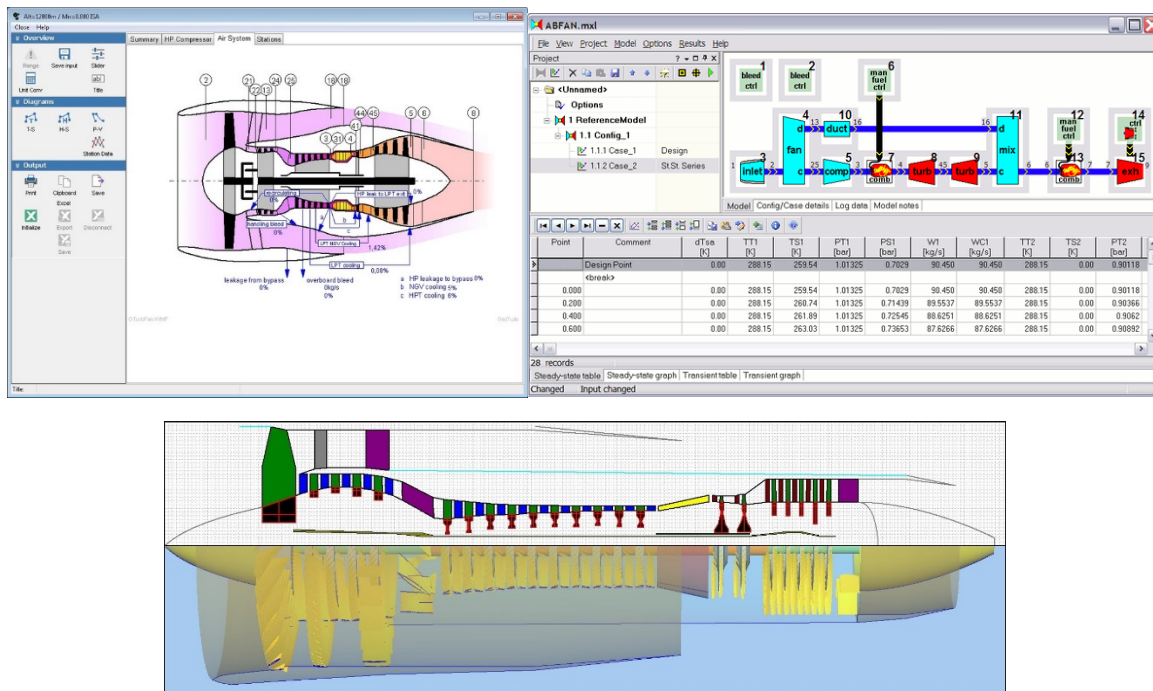


Figure 1: Screenshots of GSP, Gasturb and MDIDS.

Proposed activities:

- 1) Literature study and familiarization with software **(0.5 month)**
 - a. Literature survey on numerical methods & solvers
 - b. Review the capabilities of the different packages
- 2) Gas Turbine Reverse Engineering **(3 months)**
 - a. Design a gas turbine with fixed specifications by using the different packages. The DGEN 380 engine will be used as benchmark.
 - b. Perform sensitivity analysis and optimization of the engine.
 - c. Compare the accuracy of the different packages
- 3) Off design testing of the gas turbine **(1.5 months)**
 - a. Generate compressor and turbine maps
 - b. Perform off-design tests of the engine
 - c. Compare accuracy of the different packages
- 4) Write report & present results **(In parallel with the other activities)**

Student requirements:

- 1) Interest in **mathematics, GT theory and programming**
- 2) Good grades and sufficient credits for starting an internship
- 3) Proactive and capable to work independently
- 4) Good presentation & communication skills.

Interested students please contact Roberto Suarez for an interview/discussion.

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