

Master's Thesis - "Load Path Visualization for Engine Structures" (30 credits/20 weeks – 1 student)



Project Background

From a general design perspective, the engine structures developed by GKN Aerospace can be thought to provide the customer with a flow path and a load path. A well designed structure is the one that achieves the best trade-off between a flow path and a load path after having met its functions. The design calculations for flow paths are usually performed using specialized fluid flow software (eg. ANSYS CFX) and calculations associated with a load path, using solid mechanics software (eg. ANSYS Mechanical, NASTRAN). The calculations and consequent visualizations of the flow path and load path can be important decision-making tools during engine structures design.

For calculating and visualizing flow paths, streamlines could be plotted in the respective fluid flow calculation software. However visualization of a load path is more involved and requires additional effort. A method often termed U* method, is an interesting candidate for load path visualization in structures developed by GKN Aerospace. The method purports to plot a line, similar to a streamline that represents the principal load path (the path that takes up the maximum load in the structure). Few software exist with out-of-the-box capability to plot U* load paths. Limited implementations have been achieved within GKN using in-house capability though visualizing the load paths have been difficult, especially in 3D space.

Assignment Description

The thesis should focus on developing methods to perform the necessary calculations to generate and plot a load path for engine structures in 3D space developed by GKN Aerospace. Existing in-house codes can be a starting point. The work can be extended so that a number of structures are analyzed based on the load path.



Qualifications

Students in the final year of their M.Sc. studies in the field Mechanical or Aerospace engineering. Experience in finite element analysis using ANSYS and knowledge of a scripting language such as python is strongly recommended.

Apply by

Send your resume and cover letter to Visakha Raja, visakha.raja@gknaerospace.com

Last date for application: 2020-12-01. Interviews will be held continuously and the position could be filled prior to the last application date.

