

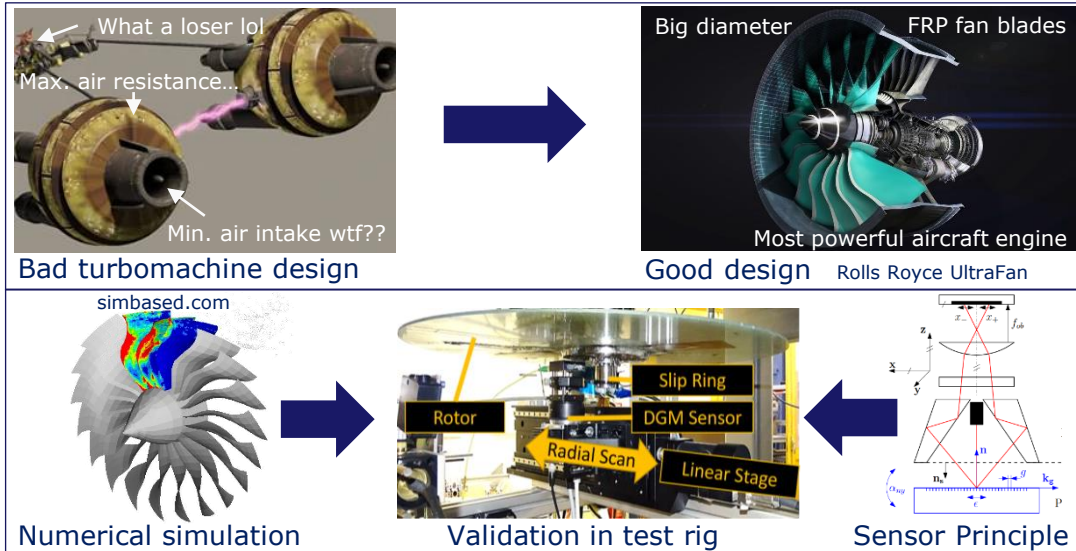
High-resolution strain sensor for fast rotating structures

Motivation

Ever heard of Boles Roor, the podracing pilot? No, you haven't, because that guy didn't win sh*t with his horribly designed engine. If you want to build a high-performance turbomachine, you need to get as much air as possible compressed for the combustion process. You achieve this by maximizing the rotor diameter and rotational speed. Fiber reinforced polymers (FRP) are predestined for this task due to their lightweight properties. However, their anisotropy is a challenge for failure prediction.

To validate and calibrate numerical models of rotating FRP structures, we developed an optical diffraction grating strain sensor. The sensor measures with high precision and spatiotemporal resolution at high surface speeds.

Your task is to redesign the sensor to increase accuracy and measurement range using adaptive optics and multiple cameras.



Tasks

- Development and installation of an optical strain sensor
- Sensor assessment via parameter study

Key words

Optical strain sensor, Parameter study

Kontakt

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