



European Project Semester

PROJECT OUTLINE

Project dates: March 2017 - June 2017	
Title: Design of a Mechatronic Test Bench for Prognostics and Health Management	
Project activity areas: Mechatronic, Prognostics and Health Management	Keywords: Mechatronic, Mechanical design, Prognostics and Health Management, Test Bench, Condition Monitoring
Tutor's name and coordinates Client – End-user: Production Engineering Laboratory Technical ENIT Supervisor + contact: Maher Baili: Maher.Baili@enit.fr Kamal Medjaher: kamal.medjaher@enit.fr	Project origin Industrial / Research / Teaching / Associative Research/Teaching
Project technical background: Maintenance activity, which takes a significant place in industry, can be seen as a source of losses if it is not done appropriately. To avoid this, new intelligent maintenances, such as condition-based maintenance and predictive maintenance are implemented instead of traditional maintenances (corrective maintenance and time-planned maintenance). These new maintenances rely on a continuous monitoring of the physical system to acquire representative data. These data are then used to assess the health state of the system, detect its faults and predict its remaining useful life. All these tasks can be conducted in the framework of Prognostics and Health Management (PHM). To perform PHM, one needs real data collected from real systems. This project aims at designing a modular mechatronic test bench that allows simulating the operation of some physical components and test some of their failure mechanisms. The test bench should also allow realizing accelerated tests to collect data about the degradation mechanisms (example: crack in a gearbox).	
Studied topics: <ul style="list-style-type: none">- Literature review about available commercial and laboratory test benches.- Specifications of the test bench to be designed for PHM activities.- Design under CATIA software of the test bench (the design should promote modularity and possibility of improvement in the future).- Modeling, computation and sizing of the test bench.	

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- Definition of the instrumentation and the control part of the test bench.
- Contact of different providers and
- Definition of assembling method of the test bench.

Deliverables:

- Test bench specifications.
- CATIA plans.
- Detailed estimates of the test bench components.
- Detailed report about the components assembling.