

Research program:
“Development of predictive diagnostic tools for modular reconfigurable automatic manufacturing systems”

Annex C

Department of Management Engineering, information and production
Tutor: **PROF. Sergio Cavalieri**

Research program

The tasks of the research program will be:

1. Analysis of Diagnostics and Prognostics methods
2. Definition of useful data set and selection of techniques to develop the algorithms
3. Development of diagnostic and prognostic tools
4. Virtual test beds for the validation of diagnostic methodologies

The first phase of the project is a review of the prognostic approaches within predictive maintenance by analyzing the foremost national and international research projects and the applications already commercially available. Furthermore, an industrial state of the art has to be performed in order to define which are the mostly used techniques and algorithms from the industrial perspective, as well as considering the weaknesses and the strengths of each approach.

The second phase is to define the data set that has to be used as historical data to monitor the health of components and to create a system for predictive maintenance. Given the methods analyzed and the data set, the third phase is related to develop models and algorithms able to perform:

- A monitor system to evaluate the health status of the equipment under observation
- A diagnostic tool, based on the set of signals extracted from the components/machine, to predict the incipient failures

Finally, a test bed will be developed to validate the tools and the algorithms.