# Component state prediction based on field experience data

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**Siemens Industrial Turbomachinery AB (SIT AB)** in Sweden is part of the Siemens Energy Sector. The Energy Sector is the world’s leading supplier of products, services and solutions for the generation, transmission and distribution of power and for the extraction, conversion and transport of oil and gas. SIT AB delivers gas turbines, steam turbines, turn-key power plants, service and components for heat and power production. All under one roof – from research and development, manufacturing, marketing, sales and installation of turbines and complete power plants to service and refurbishing. There are today about 2 700 employees in Finspång.

**Project Field Experience** In SIT AB, a large amount of field experience data is continuously generated in form of various reports from maintenance events, component repair and operation history. These reports include detailed information about the turbine operation history as well as its condition and reported damages on individual components. This field experience data, although noisy, invariably portray environmental factors, measurement errors, and loading conditions, or in short, reality. By establishment of a process to collect and maintain this information in a database format, exploration and knowledge discovery using this data became a subject of high interest. This Master thesis is a part of efforts done to develop advanced visualization tools together with the proper sequence mining algorithms to discover the hidden relationships between different events and all the other affecting variables like loading, configuration and environmental parameters.

**Project description**

Within the rotating equipment, such as gas turbines, there are critical components like turbine blades which have limited life time based on hours and cycles. Due to criticality, these components are traced and their condition is evaluated regularly at the maintenance events.

By knowing the consumed life in terms of hours and cycles until each of these condition assessments and using the complementary data from the sensors like the temperature, loading and speed, one should be able to develop some sort of statistical state prediction models to predict if the components can survive until their end of the life or not. This model can use a training dataset from thousands of previously assessed components which is available in a database. The project is suitable for 1 student with good statistical and modelling background. Student will work closely with domain experts.