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Mathematical model based decision-making methods in maintenance

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Introduction : -

- ▶ Engineering is a science art to solve the problem by mean of effective methods based on scientific principle.
- ▶ The basic method to understand the problems are as; Study the historical data, Observe or Cluster the collected data, find the cause and gap between previous solution with different conditions and then design the experimental model.
- ▶ Models always an important factor for analyzing the engineering problems.
- ▶ Regression analysis in the field of maintenance is mainly used to predict the failure or to schedule the maintenance by mean of statistical tool.

- ▶ There are 2 topics which was taken into consideration in this semester.
 1. Regression analysis
 2. Statistical hypothesis testing

- ▶ These 2 topics are studied and researched in accordance with how to make mathematical model with respect to maintenance decisions.

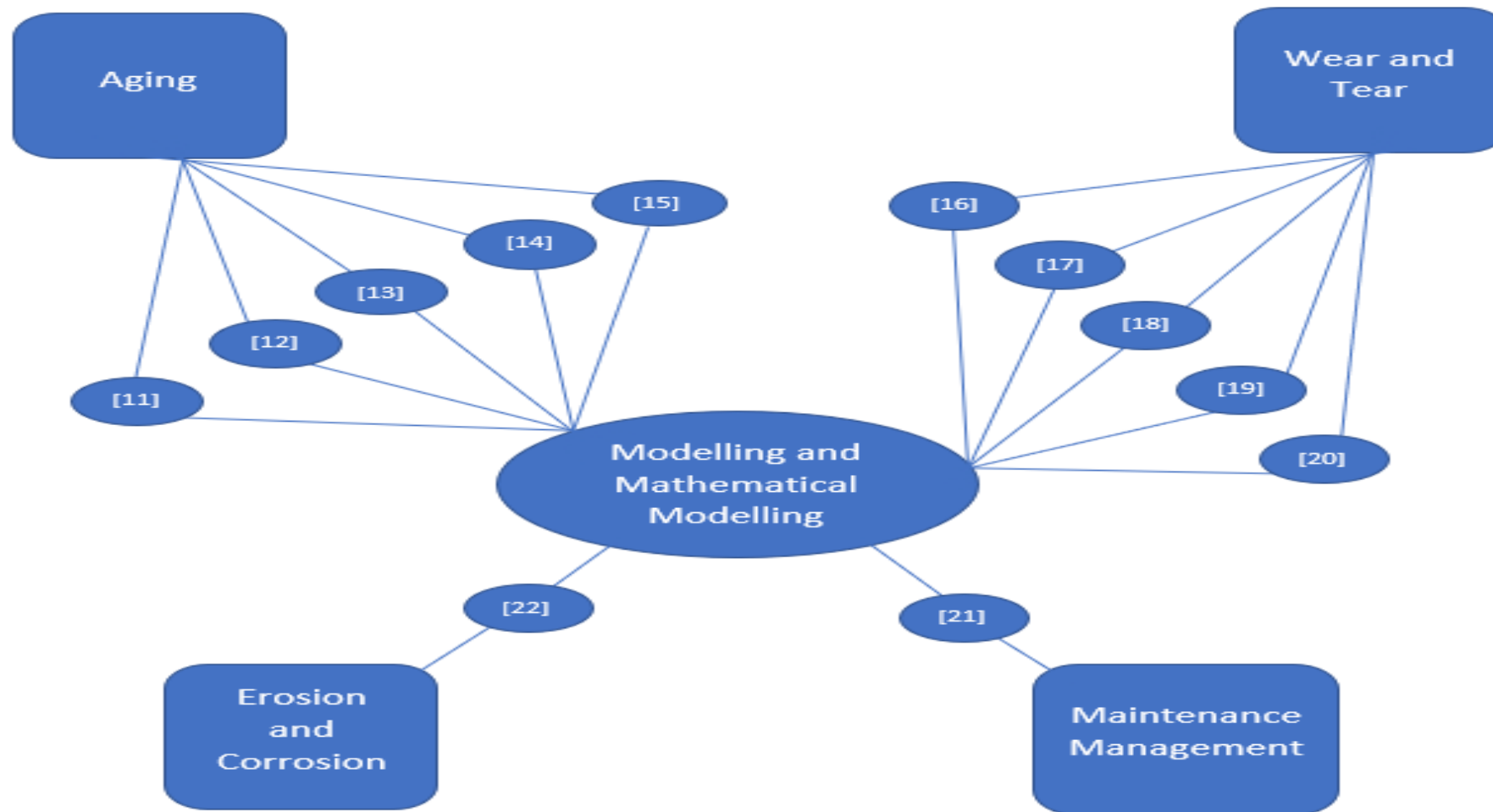
- ▶ Aim is to create a mathematical model to define aging of any technical system.

- ▶ A review has been made of regression analysis and statistical analysis in relation with aging to create a suitable mathematical model.
- ▶ These 2 techniques are reviewed briefly and presented as a short literature review.
- ▶ The data was collected from previous literature data which was made in 1st semester.
- ▶ In conclusion, I found different parameters are chose by different authors to create a mathematical model as per their application.
- ▶ These differences are reviewed and in future it will be helpful to write a review paper.

- ▶ Regarding previous literature review work, me and my respected supervisor Prof. Dr. Pokorádi László are currently working on a paper which is to be published in “Machine Design” Journal.

- ▶ The work is at completion and soon we will publish it. According to our framework, I divided my research study into 5 major parts which are given as below.
 1. Aging
 2. Wear and Tear
 3. Erosion and Corrosion
 4. Modelling and Mathematical Modelling
 5. Maintenance Management

Connection between major topics: -



- ▶ In the above figure connection between selected major topics are presented and in the review paper, these will be explained briefly.
- ▶ This review presents the basic concept of aging of technical system with the help of these 5 major topics
- ▶ This paper will work on with the aim to connect these major 5 topics with each other and as a conclusion the important and most influential factors can be determined.
- ▶ Mathematical modelling is the main approach in this work in connection with maintenance to overcome with its causes and problems to reduce the wear and tear rate of machines.

Future framework: -

- ▶ I decide to write a review paper on both topics which are regression analysis and statistical analysis.
- ▶ Another review paper is also in completion with my supervisor, soon it will be published.
- ▶ As this pandemic is at end, I will participate in different conference in supervision of my supervisor.

THANK YOU.