Guidance in Previous years - Title of Thesis

1. Predictive analytics in food grain Logistics: Supervised Machine Learning Approach
2. Assessment of mental workload in a sorting task: a game based approach
3. Influence of signalling systems on Operations of Indian railways: A simulation based comparative study
4. Physiological assessment and ergonomic Intervention of plogging activity
5. Simulation Modelling of a Mixed Model Assembly Line to improve the Operator Utilization
6. Design and development of work environment for waste sorting workers

Expectations from the M.Tech. Project

- A Conference publication (Scopus Indexed) by the end of January/February 2022
- A Manuscript for a possible publication in a Journal – expected by end of April 2022

PROBLEM STATEMENT 1

Tentative Topic: Analysis on Mental Health of Workers in a Manufacturing Unit using Cognitive Computing

Cognitive computing is derived from cognitive science and Artificial Intelligence (AI) and is the development of computer systems modelled on the human brain. Recently human factors and ergonomics is considered as a part of workstation design, which helps to improve the efficiency and productivity of workers. The mental health problems of workers in any organization causes a very serious negative impact on its performance. In order to solve this problem a classification parameter that evaluates an individual's cognitive architecture is to be developed. A cognitive architecture includes certain cognitive skills required by the worker while performing the task. The cognitive architecture and the cognitive computing process are needed to develop predictive models. The feasibility of developed models need to be checked further.

Solution approach to be adopted:

For the development of cognitive computing system builders, appropriate dataset needs to be collected from a standard repository like Kaggle. Later in the project the student needs to collect the relevant data through a questionnaire survey/experiments, if possible. In this work, the predictive models are to be developed using python programming language. Hence, a cognitive architecture based on the cognitive skills of the workers is to be developed.

Expected outcome from the project:

The cognitive computing system processes enormous amounts of data instantly to answer specific queries and makes customized recommendations. Cognitive computing in various

domains links the functioning of human and machines where computers and the human brain truly overlap to improve human decision-making.

- Cognitive architecture with the cognitive skills considered for the problem
- Cognitive computing in python
- Concept model and check the feasibility of the model

What the student is expected to learn before the project?

- A strong coding skill in python is needed for the student.
- Learn about cognitive science, cognitive architecture and cognitive computing
- Apply the coding skills for building a model.

PROBLEM STATEMENT 2
Tentative Topic: Analysis of community engagement on Social Media during disasters using Machine learning methods

The use of social media is expanding significantly and can serve a variety of purposes. Over the last few years, social media users have played an increasing role in the dissemination of emergency and disaster information. It is becoming more common for the community including the affected populations to depend on social media platforms to gather timely information. However, social media platforms present some drawbacks when it comes to information during disasters, such as information overload, the presence of noise and irrelevant information. This study focuses on analysing the impact of community engagement during disasters using social media platforms.

Solution approach to be adopted:

The solution approach for this work will be by developing different machine learning algorithms to analyse the data pertaining to community engagement during disasters with a focus to Kerala floods of 2018, 2019 and 2020. The predictive models should categorise the information as relevant or irrelevant and further classify relevant posts into reporting information and asking for information. The data from different social media platforms must be extracted by web scraping method and analyse using data analytics tools in python.

What the student is expected to learn before the project?

- A strong coding skill in python is needed for the student.
- Learn about web scraping and different data analytics tools

PROBLEM STATEMENT 3
Tentative Topic: Development of statistical models for the occupational experiences of Waste Collection Workers

The data collected pertaining to an MHRD- ICSSR-IMPRESS research project is to be used for the development of models for analysing the occupational experiences of waste collection workers.

Solution approach to be adopted: Statistical models/Machine Learning algorithms

What the student is expected to learn before the project?

- A strong coding skill in python is needed for the student.
- Learn about multi-variate data analytics techniques

PROBLEM STATEMENT 4
Tentative Topic: Modelling of supply chain disruption analytics

Solution approach to be adopted: Simulation models to analyse the impact of disruption in supply chains.

What the student is expected to learn before the project?

- A strong coding skill in python is needed for the student.
- Learn about simulation modelling