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Progress report:
A genetic algorithm based model tree forest

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MEng (Research) Industrial Engineering

31 July 2021

Signatures:

STUDENT: Werner Van Der Merwe	*SUPERVISOR:* Prof A.P. Engelbrecht

Subjects:

Due to academic background, five compulsory courses with a single thesis aligned subject are compulsory. The following compulsory subjects were all completed successfully (Some marks are yet to be received):

- Analytics and Synthesis, 25 - 29 Nov 2019.
- Research Methodology, 17 - 21 Feb 2020.
- Advanced Topics in Engineering Management, 68%, 24 - 28 Feb 2020.
- Professional communication, 31 Mar 2020.

The following thesis aligned subject was completed successfully:

- Applied Machine Learning (online), 76%, 11 - 29 May.

After being postponed due to national lockdown the following subject was completed:

- Management Fundamentals for Engineers, 9 – 11 Mar 2021 (originally scheduled 16 - 20 Mar 2020)

Thesis Progress:

The thesis title is finalised as: A genetic algorithm based model tree forest. The first chapter, literature review, is completed and reviewed. The following two chapters' first drafts are also completed and awaiting review. The fourth and final chapter is currently being drafted. Thereafter, the thesis as an entirety will be rounded off and completed.

Experimental progress started in July 2020. The initial experimental progress consisted mostly of setting up the environment and framework in which the experiments were conducted. The remaining months of 2020 consisted of developing the Model Tree Forest package in python with preliminary tuning and testing.

Thereafter during 2021 the Model Tree Forest code was further refined and alternative strategies to the implementation of the Model Tree Forest evaluated. With the best performing variation of the Model Tree Forest determined, the model could now be compared against other competing modern day chosen models. This comparison is currently in progress and expected to be done by the end of August. Thereafter, progress on the writing of the thesis itself will continue in preparation for the second hand in date in November. Everything is on track to be completed by then.

Obstacles:

One obstacle encountered was the national lockdown which resulted in the delay of both subjects as well as thesis progress. The initial loss of office space contributed to the delay of the thesis progress. A work environment took time to establish at home. Progress resumed as normal during 2021. Initial poor results of the model led to the need for further investigation and refinement, pushing back the expected hand in date to the second opportunity.