GP-based Model Predictive Control*

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***Abstract*— Describe topic and relevance in a few sentences so that the reader is motivated to read the whole paper.**

I. INTRODUCTION

Model predictive control (MPC) is a popular control strategy which uses a dynamic plant model to obtain the control input that optimizes future reactions of the plant [3]. The performance of MPC depends highly on how well the model captures the dynamics of the plant [2]. But the identification of an *a priori* model can be challenging and the dynamics of the plant could also change during the application [2], [4]. Therefore, a simple and fixed nominal model of the plant can be used in combination with a learned disturbance model. The disturbance model represents the error between the observed behaviour of the plant and the behaviour of the nominal model [4].
In this report we present the results of our project within the course Statistical Learning and Stochastic Control. First, our literature research on GP-based MPC is summarized. Then a short introduction to the theory of MPC and GPs is given. Later, two examples which's implementation was part of the project are explained.

Introduce topic and describe motivation and relevance of problem/topic.

In this paper we give an introduction to the results presented in paper(s) [1]. We present the main results, discuss ideas and illustrate the results with simulations.

Notation. Define notation.

II. BACKGROUND

Necessary background in nonlinear systems and control (material beyond what was considered in the course.)

Model predictive control (MPC), receding horizon control or moving horizon control are all names for a control strategy which

III. MAIN RESULTS

Ideas, theorems, proofs and discussions .....

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IV. EXAMPLES

Show and discuss simulation examples etc....

V. CONCLUSIONS

Summarize the main points (with more details than in the preceding introduction). The paper should not be between 4 and 8 pages.

APPENDIX

Appendixes should appear before the acknowledgment.

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