



Interdisciplinary project - *Interdisziplinäres Projekt*
for
Student
Student No.: XXXXXXXXX

Thesis received: 29.04.2020

Workload: 360 h (12 CP)

Submission of thesis until: 29.10.2020

Duration: 6 months

Examiner: Prof. Dr.-Ing. U. Nackenhorst

Supervisor: Steffen Funk, M.Eng.

Adaptive sampling for support vector regression
Adaptives Sampling für Support Vector Regression

Support vector regression (SVR) is an effective method in the field of surrogate modelling. Surrogate modelling itself is a non-intrusive model reduction technique. To construct a reduced model with SVR, the choice of the so-called training points is essential. The training points should be located in an optimal manner, which is a part of the sampling procedure. In comparison with one-step sampling methods, adaptive sampling methods are beneficial, because, in general, they need much less training points. However, finding these training points based on existing ones is not trivial and, nowadays, a substantial research field.

Within the scope of this project, an adaptive sampling method for SVR in elasto-plasticity should be investigated. The scheme should balance between exploration and exploitation, which are space filling techniques globally and locally, respectively.

Required knowledge (to be caught up in self-study when needed): Fundamentals of model order reduction, for example obtained from the *Model Order Reduction* master course offered by IBNM institute. Fundamentals of solid mechanics, for example obtained from the *Solid Mechanics* master course offered by the IBNM institute. Basic programming knowledge is mandatory.

This thesis can be supervised/written in German or English.