Conclusion

In the chapters of this thesis paper, a new approach for model discrimination, validation and parameter estimation was presented: *the model–data–overlap.*

More explicitly:

(1) The model–data–overlap was introduced, motivated and distinguished in detail from existing approaches. By matching model and data variability, referred to as the overlap, and by interpreting parameters as distributions, one can cope with structural data–model–deviations that are due to model uncertainty. The overlap number establishes a model ranking in terms of model–data–reproducibility based on parameter sensitivity; a type of ranking which is appropriate when the model's trustworthiness is not given. (see chapters 2 & 4)

(2) Algorithmic questions concerning the implementation were investigated. Three approaches to calculate the model variability for dynamical systems were presented as well as their advantages and challenges discussed. Additionally, the aspect of adapting the optimization to the propagation scheme was shown for the linear case. (see chapter 5)

(3) The implementation approaches were successfully demonstrated for linear ODE and biokinetic models. Furthermore, it was shown that the results of the overlap discrimination allow for different statements and interpretations in comparison to calibration methods. (see chapter 6)