Content

1. **Simulations**

All simulations described in the thesis are conducted using Python Jupyter Notebooks. To run the simulations, the sumProduct library in the present version is required.   
The simulation results are based on the following documents in the folder:

1. *sumProduct*

All subsequent notebooks and results are based on this library for message passing with the sum-product algorithm in graphical models written by D. Endres. It allows constructing graphical models and variational inference in these models.

1. *Simulations\_Basic Model*This notebook was used to implement and simulate data with the basic model. It was written by the author of the thesis, under supervision of Dominik Endres. All result plots found in the thesis can be reproduced using this notebook and the specific settings for the precision of the prior parameter described in the main text.
2. *Simulations\_Latent Model*This notebook contains the code used to implement and simulate the latent model. All plots printed in the thesis can be reproduced using this code and by adjusting the parameters to the specific values described in the thesis. The notebook was written by the author of the thesis under supervision of Dominik Endres.
3. *Simulations\_Timestep Model*This is the notebook used to implement and simulate sequential developments in chronic pain. It also contains the code to recreate the three-dimensional surface plots printed in the thesis. This notebook again was written by the author under supervision of D. Endres.
4. *PrecisionPlots*This notebook was used to generate the learning plots printed in the thesis. They can be recreated by adjusting the prior precision of the factor nodes according to the descriptions in the thesis.
5. **Data and descriptive statistics**
6. *Descriptives*  
   All descriptive analyses and the corresponding plots were done using this notebook. It was written by the thesis authot.
7. *PI-ANNA\_DatenN=36CSV*

All analyses and the model selection procedure were based on this dataset kindly provided by Tanja Hechler and Luca Schaan from the university of Trier.

1. **Model comparison**
2. *Model\_comparison\_prior*

This notebook was used to conduct a model comparison on the first four items of the PI-ANNA questionnaire, assessing the expectation of pain at different times of the day. It contains the implementation of all models described in the main text of this thesis plus the model comparison and the plots showing the resulting posterior probabilities of all discussed models. To run this model, the dataset and the sumProduct library are required.

1. *Model\_comparison\_likelihood*This notebook contains the implementation of all models that were used to analyze the data concerning the participants’ likelihood. It also contains the transformation of model evidence scores into posteriors and the model comparison plots.
2. **Thesis**The thesis was written in Overleaf, an online LaTex tool. For further information on authorship, see thesis preliminaries.