Institut für Regelungstechnik
Leibniz Universität Hannover

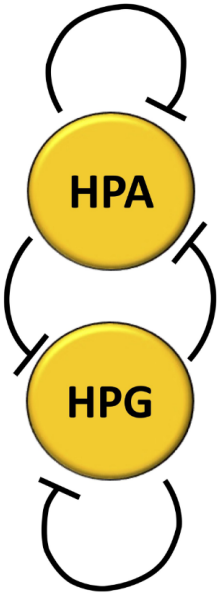
Leibniz Universität Hannover

Masterthesis

Control-theoretic analysis of the interactions between the hypothalamus-pituitary-gonadal and hypothalamus-pituitary-adrenal axes

Neuroendocrine networks such as the hypothalamus-pituitary-gonadal (HPG) and hypothalamus-pituitary-adrenal (HPA) axes are responsible for regulating hormones in the human body via feedback loops. Under certain conditions, pathogenic processes can arise in these systems. To develop new and improved treatment strategies, a detailed understanding of the function of these systems and their interactions is desirable.

One promising approach for characterizing the function of these networks is to apply tools from systems and control theory to analyze mathematical models of their behaviour. Potential tasks for a thesis include performing a literature search, implementing simulations of the models and performing a control-theoretic analysis of their behaviour, comparing various models, and extracting biological insights from the results.



Requirements:

- Proficiency in English
- Background in systems and control theory (RT I, RT II, NLC)
- Strong motivation and willingness to engage in biomedical research
- Familiarity with MATLAB

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