

Reinforcement learning based Dosing in Case of Graves' Disease

The thyroid gland produces essential hormones, regulated by the brain through a feedback loop. Autoimmune diseases disrupt this loop, requiring medication to restore its normal function. The Institute of Automation and Control and a group of the Medical University of Graz have jointly developed a mathematical model describing the main dynamics of the relevant thyroid hormone. This model is used for the simulation of disease progression and subsequently for the development of computer-aided treatments.

Preliminary successes have been achieved in the treatment of Graves' disease utilizing reinforcement learning techniques. The objective of this thesis is to explore additional methodologies within this domain. This work includes:

- Getting to know the training framework (repositories implemented in python)
- Implementation of an interface for existing approaches
- Implementation of further RL algorithms such as Monte Carlo methods or Double DQN
- Analysis and comparison of the results
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