Coding for DNA Storage (Seminar/ Project / Thesis)

Fachbereich 18
Elektrotechnik und
Informationstechnik
Selbstorganisierte Systeme

Department 18
Electrical Engineering and
Information Technology
Self-Organizing Systems Lab

Prof. Dr. Heinz Koeppl
Head of lab

The Self-Organizing Systems lab is currently looking for students interested in applying coding theory to DNA storage.

DNA storage refers to the idea of using DNA as data storage, whereby the nucleotides making up the sequence encode for the information. The data is stored by synthesizing the desired DNA sequence and retrieved by means of DNA sequencing. While DNA based data storage has enormous potential with respect to capacity and durability, this potential is accompanied by challenges arising from reading and writing the information from and to the DNA, but also the DNA itself. The DNA inherent challenges are for example mutations, deletions, insertions and constraints on the sequence used. To overcome these challenges, the goal of this project is to develop a coding scheme matching the needs of DNA storage and allowing for robust information storage.

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Tasks arising within this project are:

- Identify coding schemes used for DNA storage
- Identify the challenges for codes with respect to DNA storage
- Evaluate the suitability of coding schemes for DNA storage
- Identify adaptions necessary to one or multiple existing schemes
- Implement and evaluate the proposed adaptions

The following skills are beneficial for this project:

- Background on information theory
- Background on coding theory
- Programming skills

We are always happy to hear about your own ideas on this or any other topic related to synthetic biology and information theory. We look forward to hear from you.

For further information, please contact Erik Kubaczka.