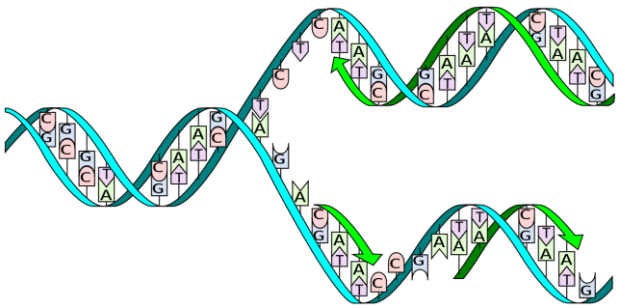
Thesis Proposal (MA)

Data Replication Mechanisms for Smart Spaces

Outline



Smart Spaces are spaces with computing hardware that interfaces between the Cyber and the Physical World. Examples for such devices are remote controllable building control entities such as shutters, lighting, air conditioning, heating, ventilation, multimedia equipment, etc.
For the past years we developed the Distributed Smart Space Orchestration System (DS2OS). It is a middleware framework that manages service Apps within Smart Spaces. The core of DS2OS is the Virtual State Layer (VSL) middleware. It is a self-organizing Peer-to-Peer system that manages all data within a Smart Space.
Resilience is important in Smart Spaces since they can contain relevant control and monitoring Apps. In this thesis you will explore different mechanisms for enhancing the resilience of the core system of a Smart Space, the VSL. An example is K-redundancy. You will identify, implement and evaluate different mechanisms for replicating data. Questions to be answered include, which mechanisms for duplicating data to enhance resilience exist? How can we evaluate them? How do they perform compared to each other?

Possible Structure

- Analysis
  - Analyze the problem domain.
  - Identify relevant research questions that you will work on.
  - Present relevant technology.
- Related work
  - What do other projects do that answer your questions?
- Design
  - Which components do you need?
  - Which are options for the design? Why are your choices good?
- Implementation
  - Relevant details such as frameworks used.
- Evaluation
  - How well does it work?
    - Metrics!

Requirements

Curiosity, Joy to work in a team, Knowledge in Java.
Ability to write good code (including unit tests and documentation).

Contact

If you are interested, please send an email briefly explaining why you think to be the right person for this thesis to:
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Image sources: https://commons.wikimedia.org/wiki/File:DNA_replication_split_horizontal.svg
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Distributed Smart 2pace Orchestration System

ds2os.org/