

Development of a mapping system of bionic structures in TRIZ inventive principles

Background and motivation

For years, nature gives an inspiration to engineers in design, because nature has a perfect and efficient system. Therefore, there is a great product development potential for using bionic solutions in mechanical problems. For this reason, some database such as asknature.org have been developed to categorize bionic solutions. On the other hand, all mechanical problems can be defined by TRIZ's 39 technical parameters. TRIZ is a creative thinking method for solving mechanical problems. This thesis will serve to categorize bionic solutions for mechanical problems using the TRIZ method in terms of design automation.

Tasks

The following tasks should be dealt within this thesis:

- Literature review on TRIZ method and bionic solutions for engineering problems
- Understanding of relations between biomimicry taxonomy and TRIZ method
- Developing a mathematical method to automatically map bionic structures in TRIZ inventive solutions
- Validation of the accuracy of the mapping system

Qualifications

- Study in mechanical, computational, chemical engineering or similar
- Programming skills in MATLAB or Python
- Ability for imagination of mechanical solutions with bionic structures
- Experience with 3D Modelling

This thesis can be written in German or English. At the end of the thesis, the results will be presented in an institute seminar.

Beginning of the thesis: As soon as possible

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