IT3708 - Bio-Inspired Artificial Intelligence (BioAI)

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Topics:

1. Introduction to and Background of BioAI
2. Optimization via BioAI: Combinatorial and Continuous
3. Hillclimbing and Stochastic Local Search
4. Genetic Algorithms and Search with Populations
5. Constraint Handling
6. Multimodality and Diversity
7. Applications of BioAI
8. Theory of BioAI
9. BioAI and Machine Learning
10. Working with Evolutionary Algorithms
11. Evolutionary Algorithm Variants
12. Multi-Objective Optimization
13. Hybrid BioAI including Memetic Algorithms
14. Ant Colony Optimization
15. Particle Swarm Optimization

- Two main textbooks
  - "Evolutionary Optimization Algorithms," by D. Simon, Wiley 2013
  - "Introduction to Evolutionary Computing," 2nd Edition, by A. E. Eiben and J. E. Smith, Springer 2015
- Lecture slides
- Other materials, such as articles and papers
- Programming projects, typically 3, at the interface of "traditional AI" and BioAI

The **topics** of the course correspond to substantial parts of *Part I and Part II* from Simon's textbook and Eiben and Smith's textbook. Plus *selected topics from Part III / Part IV* of both books and other sources.