AI – Augmentation for Autonomous Spacecrafts

We are working on a novel type of spacecraft that shall in the future autonomously explore small solar system bodies. In a consortium with other partners in academia and industry our goal is to develop algorithms that allow the agile flight in low altitude for this novel type of lander.

To overcome autonomy challenges in this mission the use of machine learning is investigated to meet the problems that arise e.g. from a loss of the navigation solution, the interaction of maneuvers and observability, and the need to quickly scan large areas for safe landing sites.

Task Description:
- Work on the following research problems
  - Sensor-based planning
  - Sensor-based emergency landings
  - AI-augmented landing site detection
  - Bayesian optimization
- Experimentation with applicable ML methods
- Conducting (simulation) experiments and parameter tuning
- Set up test cases for developed algorithms
- Transfer of neural networks to Simulink for testing
- Hardware in the loop tests on representative co-processor

The work may be extended into a Master’s thesis

Requirements:
- Finished Bachelor’s degree
- Strong performance in Master’s program
- Programming experience (in Matlab, Simulink, Python, C++)
- Experience with machine learning (as e.g. from the lecture Applied Machine Learning)
- Independent, diligent working style

Your application should include:
Resume, Overview of grades, short statement why you want to work with us on this problem

Kontakt:
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