

Bachelor / Master Thesis

Using AI/ML to improve tracklet and object correlation algorithms

YOUR MISSION:

One of the challenges in Space Situational Awareness (SSA) systems is the correlation of measurements taken from sensors with objects maintained in an object catalogue. This matching involves the weighing of many input parameters to get to a certainty that a given object matches the measurement taken from a sensor. Especially during the bulk deployment phase of satellites (e.g. CubeSats), this is an issue: as the spatial separation of the satellites is small the correlation process has proven to be error prone. In order to improve this situation promising AI/ML approaches should be researched and applied. Within this thesis the following work shall be performed:

- The theories behind current correlation algorithms as well as fundamentals of AI/ML approaches must be explored.
- An evaluation of the applicability of the AI/ML approaches must be performed.
- A prototype based on AI/ML techniques shall be developed and evaluated.
- Validation scenarios shall be derived and object populations created using in-house tools with measurement and catalogue generation
- The prototype shall then be applied to these scenarios.

YOUR PROFILE:

- Studying computer science, data science, or a related field of study,
- Practical experience in applying machine learning / artificial intelligence to problems from an unfamiliar domain,
- Practical programming skills (both compiled and interpreted languages)

YOUR BENEFITS:

- Team of motivated entrepreneurial colleagues and experts in the space domain
- Fair payment
- Free coffee, lunch routines and fun office events

ABOUT US:

OKAPI:Orbits is a young start-up developing an innovative AI-based platform for automated collision avoidance of satellites. We value entrepreneurial-minded, creative people, who are willing to take responsibilities to actively contribute to the development of OKAPI:Orbits and its products.

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