Bachelor or Masters thesis

Systems Engineering Approaches for Dual-Use Space Technologies

Supporting Arms Control in Space (SACS) - Junior Research Group
Faculty of Social Sciences & Faculty of Aerospace Engineering

Description of Proposed Topic

With rapid advances in space systems by both state and commercial actors, dual-use technologies (serving civilian and military purposes) have become widespread. Technologies like in-orbit satellite servicing, debris removal, in-orbit manufacturing, and laser communication increasingly blur the line between peaceful and hostile intent, complicating identification and verification. This highlights the need for structured, engineering-based methods to assess the dual-use nature of space technologies early in their design.

Objectives of the thesis

- Identify how systems engineering methods can be applied to assess whether a space technology may serve both civilian and defence (dual-use) purposes
- Definition of measurable criteria (technical, operational, ethical) for dual-use classification.
- To propose a decision-support model for early evaluation of mission concept.

Skills Required

- High levels of motivation to address this crucial topic
- Knowledge of Systems Engineering/Space Systems Engineering
- Ability to synthesize technical and policy research
- Understanding/willingness of technical, ethical, and policy aspects of dual-use technologies

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