

IAF SPACE SYSTEMS SYMPOSIUM (D1)  
D CATEGORY "INFRASTRUCTURE" - Extra Session (8)Author: Mr. Jan-Peter Ceglarek  
TU Darmstadt, GermanyAI4CE – GENERATING AND TESTING CUBESAT DESIGNS WITH THE AI SYSTEM  
GENERATOR HUB**Abstract**

Artificial Intelligence (AI) yields the capability to bring unforeseen innovation to the systems engineering challenges. It can help to manage requirements, support with design knowledge from previous missions or help with the creation of entirely novel designs. It is not science fiction anymore to imagine a machine, where with a press of a button an AI can generate the perfect component list for a specific scenario. But which AI is the best for the job and how can this generally be achieved as well as validated? Is AI even the best option? AI for Concurrent Engineering (AI4CE) offers the necessary tools to define a desired system, select the fitting components with multiple methods and compare their results. Thereby it enables research to test the effectiveness of AI-based system generation. Starting with the generation of CubeSat designs, the user can generate and compare results between different system generation methods (AI and non-AI) and between generated and real-world designs. The various tools of the hub enable individual steps in the system definition, generation, and comparison process. Current development focuses on providing analytical tools to make satellite designs comparable. First tests include generating CubeSat component lists with various methods. Dedicated dashboards analyse the behaviour of the system generation method and general performance of the generated design, with the goal to identify the feasibility of AI system generation methods for the usage in the early phases of a system design process. The full paper provides an update on the latest developments and discusses the results of complex tests and validations to assess the feasibility of the followed approach.