A Model of Firsts: A Student Rendering of NASA's Cassini-Huygens Spacecraft

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Abstract. NASA's Cassini-Huygens mission to the Saturn system was known as "a mission of firsts" because of its numerous scientific achievements and notable mission accomplishments. At this time, there is no publicly available descriptive SysML model of the Cassini-Huygens spacecraft.

As part of preparation for a summer internship as a system modeler, the author began modeling exercises supported by the SAIC Digital Engineering Validation Tool (v1.5). As a subject for these drills, he selected the Cassini-Huygens modeler/lander combination due to the availability of source material and his interest in space exploration.

This paper will present the outcome of these modeling exercises, lessons learned, and commentary about the utility of using automated validation rules and a model-based style guide as training aids for junior modelers.

Biography

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Nathan J. Vinarcik is a junior in the Mechanical Engineering Program at the University of Detroit Mercy; his two summer internships have been with the Jet Propulsion Laboratory and Ford Motor Company.Nathan is an Eagle Scout with six palms, was the first Scout in Michigan to earn the Thomas A. Edison Silver SuperNova Award (Scouting's highest STEM honor), and is a Brotherhood member of the Order of the Arrow (Scouting's Honor Society). He served as Vice-President of Image and Spirit for his FIRST Robotics Competition team and was a member of the first homeschooled team to compete in the Michigan Future City Competition. Nathan was a finalist in the 2019 NASA Model Based System Engineering (MBSE) Habitat Library Challenge and is the 2020 recipient of the INCOSE Michigan Chapter Student Leadership Award.