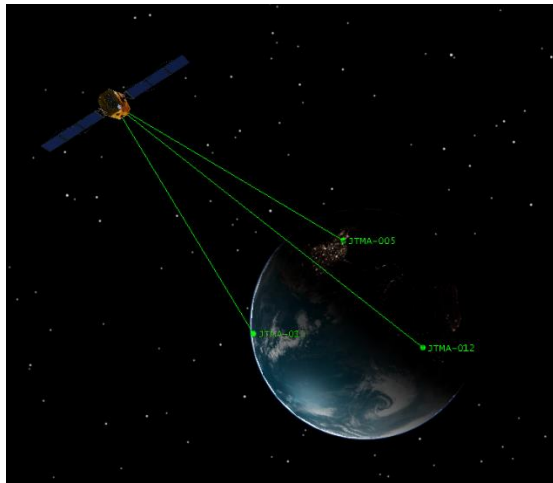




Case Study: Machine Learning Spacecraft Maneuvers

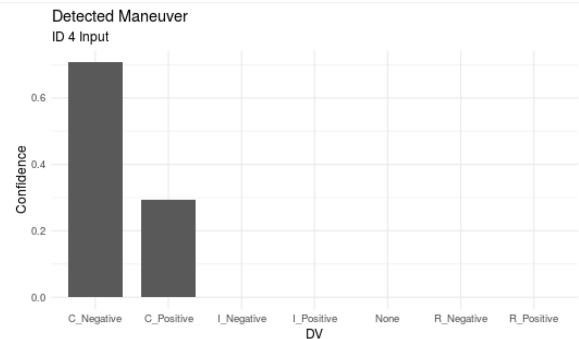
For thousands of years sparse celestial observations have enabled us to travel the seas beyond the sight of land and explore the planet. Today, similar sets of observations are enabling us to better understand space travel.



Ailantic developed AI machine learning algorithms to detect and characterize satellites' maneuvers with sparse data.

Some satellites in orbit must maneuver to maintain their relative position over the earth below. Validating the direction and magnitude of a satellite's engine firing is essential to providing safe and secure space operations. The remoteness of space means these maneuvers must be deduced from limited ground observations. Analytical Graphics, Inc. (AGI) develops highly accurate software to model and analyze this environment. Ailantic, LLC worked with AGI to develop novel artificial intelligence (AI) machine learning approaches to detect and

characterize spacecraft maneuvers with very sparse data.



Sparse data is used to predict the type of maneuver observed with confidence probabilities to assist orbit analysts

Working together with AGI technology and orbital analysts, Ailantic developed highly accurate AI prediction algorithms to automate the identification of imperceptible patterns. This has resulted in dramatic improvements in early characterization.

“AI is enabling us to significantly extend AGI technology in this critical area of spacecraft maneuver classification, providing earlier and automated detection with sparse observations”

- Doug Cather, Space Operations Technical Director, Analytical Graphics, Inc.

Ailantic provides AI products and services creating innovative solutions to complex problems by helping people discover AI and data science. Ailantic navigates technology adoption by identifying candidate AI solutions and collaborating with commercial and academic partners to develop concepts, demonstrate feasibility and deploy revolutionary technology.

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