



PROJECT SPACE CLOUD

Satellites are good at observing but not so great at sorting. While modern spacecraft can deliver a flood of data, it's up to analysts on the ground to sort through all of this material to find any valuable intelligence. But what if a satellite could do the sorting and only send data an analyst is searching for?

Delivering Artificial Intelligence to Space

Aerospace engineers recently developed Space Cloud, an artificial intelligence system that uses modern cloud computing to enable satellites to detect and transmit only meaningful data. Space Cloud teaches satellites to send back information of interest to an analyst and discard the rest. Once the mission is complete, an analyst can request the satellite to search for a new target.

Dr. Josh Train, chief engineer for the Space Systems Group and his team built Space Cloud with commercially available technology, including an Intel Movidius processor and the open-source Kubernetes tool to enable temporal-geospatial software scheduling. An analyst can now task the same satellite to search for specific objects over predetermined areas such as searching for goats when the satellite is over terrestrial areas and searching for boats when it is over water. The result is usable data and persistent overhead monitoring.

"We are excited about being able to demonstrate this technology on a CubeSat in the fall, but we know this demonstration is just the tip of the iceberg," says Train. "In the last 20 years, we've seen an explosion of innovation in computing, and there is a lot of cloud and A.I. technology that has not yet been harvested for its use in space. At Aerospace, we are lucky enough to get paid to figure out how we can revolutionize a whole industry by stretching these technologies all the way out to outer space."

The Aerospace Corporation

The Aerospace Corporation is a national nonprofit corporation that operates a federally funded research and development center (FFRDC) and has approximately 4,000 employees. The Aerospace FFRDC is aligned to support the most critical programs of the Department of Defense and the nation, and to serve as its customers' innovation partner across the space enterprise. Consistent with the competencies outlined in our sponsoring agreement, Aerospace provides strategic value through independent, intellectually rigorous, relevant, and timely products and services. With three major locations in El Segundo, Calif.; Colorado Springs, Colo.; and Washington, D.C., Aerospace addresses complex problems across the space enterprise and other areas of national significance.



"We knew there was a ton of technology that had transformed the way we approach data on the ground—the challenge is that no one had adapted it so that it would work in space."

*Dr. Josh Train
Chief Engineer
Space Systems Group*