Architecture of Intelligent Earth Observation Satellite for Common Users in 2010-2050

GUOQING ZHOU
Old Dominion University

This proposal presents a revolutionary and advanced aeronautical and space concept that could dramatically impact how NASA develops and conducts missions within NASA Enterprises in the next 20 to 40 years. It will generate ideas for how the current NASA Agenda can be done better.

The proposed "intelligent" satellite system is a space-based architecture for the dynamic and comprehensive onboard integration of Earth observing sensors, data processors and communication systems to enable simultaneous, global measurement and timely analysis of the Earth's environment for real-time, mobile and common users in the remote sensing, photogrammetry and GIS communities. In the short run, this proposal only provides a highly visible, recognized and high-level entry point, specifically systems and architectures of "intelligent" earth observation satellites. In the long run, we will research how to implement the "intelligent" satellite, including technical problems, development phases, costs, and the steps of implementation. The proposed architectures and implementation strategies are a seamless integration of diverse components into a smart, adaptable, and robust Earth observation satellite system.

This proposal is based on a decade of teaching and research experiences in remote sensing, GPS, photogrammetry, GIS, and natural resources management.