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THE TECHNICAL AND COMMERCIAL INCREMENT OF THE FUSION OF BIG DATA ANALYSIS,
ARTIFICIAL INTELLIGENCE AND EARTH OBSERVATION**Abstract**

Earth Observation (EO) is one of the most important applications in downstream space activities. It is widely used in environmental monitoring, urban planning, topographic mapping, agricultural censuses and disaster prevention. However, traditional remote sensing satellite is subject to high cost and long data acquisition cycles and it is difficult for users to get the data in time. These problems result in insufficient data supply capacity of remote sensing satellite, which leads to difficulties in supporting daily business applications and establishing a fast-growing business model.

The small satellite segment has seen rapid market growth and technological advancements since 2013 following the multiple successful launches, most notably the Planet, Spire and others. Economies of scale during production are one of the core advantages of the small satellites segment, thus allowing for significant cost reduction throughout their development and production cycles. At the same time, big data analysis and the artificial intelligence (AI) industries are booming. Periodically full coverage data from small satellites provides a data source for data mining and periodic statistics for a wide range of targets. It provides huge opportunities and extension channels for the applications of big data analysis and AI in EO.

The present paper describes research on the technical and commercial increment of the fusion of big data analysis, AI and EO. In the first section of the paper, a literature review of the common downstream space activities along with identifying the limitations of Earth Observation in terms of high cost and long data acquisition cycles is presented. In the second section, the paper outlines a 4G case study to show that how the improvement of infrastructure brings new application scenarios, verticals and consumers. In the third section, the paper considers the possible new market opportunities of the 5G technology in the fusion of big data analysis, AI and EO. Finally, it concludes by proposing two prototype models in agriculture monitoring and disaster and emergency response, assesses the technical and commercial increment relative to the current business.