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SATELLITE DATA COMPLETION

**Abstract**

Cloud cover represents up to 60% of the Earth's surface annually. The global earth observation market in 2015 represented 7 billion euros. Knowing that this market relies on data provided by satellites which are partially unexploitable when there are clouds, the number of economic losses for satellite operators is very important. Even though it exists techniques of cloud removal in both near-infrared and visible, they are not efficient enough for specific earth observation needs. Moreover, cloud cover problems induce a loss of precious data for scientific missions associated with the poor timing of "revisit" of earth observation satellites. Thus, bringing solutions to the table will have a significant impact both economically and scientifically for satellite operators and their customers. Indeed, cloud-free images are required for many applications such as rescue missions, defense and health which needs a high responsiveness. In this paper, we analyze a satellite data completion system which helps to produce cloud-free images with a high responsiveness and to complement earth observation data. This system is based on data fusion from multiple aerial sources. In this study, we focus on satellite data completion thanks to a UAV fleet equipped with imagery payloads and a data fusion framework. We explore business challenges of using such a solution. We found out that it provides precise, quick, flexible and continuous earth observation data when satellites are not able to do so. Still, some business limits appear as the value chain is not well defined for this completely innovative complementary system of satellite imagery. However, regarding the empirical implications of this study, it opens new business perspectives for satellite data providers and operators in order to leverage complete satellite data.