

HUMAN SPACEFLIGHT SYMPOSIUM (B3)
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UNESCO-42: RAPID DEVELOPMENT OF AN EARTH OBSERVATION SUPPORT SOFTWARE FOR
THE INTERNATIONAL SPACE STATION.

Abstract

The crew of the International Space Station have taken in past years hundreds of thousands of photographs of Earth with various purposes, from documenting human impact on Earth (city growth, agricultural expansion. . .) to observing natural phenomena (volcanoes, hurricanes. . .). Samantha Cristoforetti, Italian astronaut from the European Space Agency and ISS expedition 42 crew member, had the wish to take as many pictures as possible of UNESCO World Heritage Sites. In order to support this activity in a time and cost efficient way, the European Astronaut Centre has quickly designed and created a web tool, based on open source and/or free APIs, to predict potential observation opportunities for UNESCO World Heritage Sites, taking into account the trajectory of the Station, the location of the various sites, the foreseen duration of the observation window and the local weather conditions. From the beginning of expedition 42, the tool has been used on ground with minimal effort and manpower, to almost automatically provide Samantha C. during her mission with a daily list of photographic targets, which she then consulted and used as her on-board schedule allowed. This article will present in more details the architecture and design of the web tool, its operational use and the feedback and lessons learned. We will also discuss the outlook in terms of foreseen improvements and utilisation for the next European crew members of the International Space Station.