Artificial Intelligence in ESA: Vision, Strategy & Applications

Names and affiliations of the authors: Alessandro Donati (1),
Raffaella Franco (1)
(1) European Space Agency, Germany

Keynote speaker: Alessandro Donati

The European Space Agency has already started to investigate opportunities of exploiting emerging AI technology for the benefit of European space projects since early 2000. A series of successful applications, were initially focused in the area of telemetry based diagnostic and in operations planning and based on a variety of AI technologies. These results have positively contributed to accelerate the adoption of AI in all fields of possible applications, including spacecraft development, space operations, payload data exploitation and corporate applications. The presentation objective is to give the audience a comprehensive overview of today's ESA vision on AI, of the ESA core activities with AI and of the identified AI domains and technologies of relevance for space. A series of examples of potential future applications will provide additional details on the work that will attend all of us in the near future. The presentation is also intended as introductory to the new issue of the comprehensive public ESA document "AI in Space".

Short Biography of Keynote speaker:
Alessandro Donati has 30 years of experience in satellite operations at the European Space Operations Centre of ESA in Darmstadt, Germany. He was involved with the ESA Manned Space Program as Ground Segment manager for the phase A and B of the Automated Transfer Vehicle (ATV). He joined the Cluster 2 mission flight control team and contributed to the Cluster 2 LEOP and Commissioning phase. In 2001 Alessandro founded and since then is leading a skunk-work style managed team of AI experts devoted to introducing and exploiting Artificial Intelligence technology in support of innovative space mission operations concepts. The operational tasks covered include planning, scheduling, diagnostic, resources management, behaviour modelling and forecasting. He co-hold two ESA patents related to AI applications for space. As of 2019 Alessandro is Deputy-Head of ESA's Digital Technologies community, which includes Artificial Intelligence and member of the ESA/CLAIRE AI Special Interest Group on Space. Alessandro holds a Master of Electronic Engineering from the University of Rome La Sapienza.