

MAE Departmental Seminar

Time/Location: January 18, 2018 at 1:30pm in ME3124

Title: PULSAR (Prototype of an Ultra Large Structure Assembly Robot)

Abstract:

In the context of the European Commission Horizon-2020 Research funding, an European roadmap have been defined by a consortium composed of the main European space agencies (ESA, DLR, CNES, UK SPACE, ASI and CDTI) to improve the European competitiveness in Space Robotics.

Space Robotics has been identified by European actors as a key technology for improving the competitiveness of the European space sector. The European Commission has set up the “Space Robotics Technologies” Strategic Research Cluster (SRC) in Horizon 2020, with the goal of enabling major advances in strategic key-points of Space Robotics Technologies, in order to improve the European competitiveness. The main objective of the SRC for Space Robotic Technologies is the creation, within the 2020-2030 timeframe, of the necessary tools to ensure and consolidate the maturity of the Space Robotic technologies for orbital maintenance missions and planetary exploration, and contribute to guarantee the leadership of European capabilities in Space Robotics at world level within the 2020-2030 timeframe. To fulfill this objective an European roadmap composed of three successive calls (2016,2018 and 2020) have been defined by a consortium of the main European space agencies (ESA, DLR, CNES, UK SPACE, ASI and CDTI) .

In this presentation we present: in a first part, an overview of this roadmap and their first results, then in a second part, more details on the PULSAR project will be provided. This project is related to the operational grant 8 of this roadmap and aims to develop and demonstrate the technology that will allow the on-orbit precise assembly of a very large structure by an autonomous robotic system. Autonomous assembly of large structures in space is a key challenge to implement future missions that will necessitate structures too large to be self-deployed as a single piece, and PULSAR is organized in three demonstration tracks to address the major challenges of in-space autonomous assembly of telescopes.

Speaker Bio:

Mathieu Rognant received the M.S. (2007) and Ph.D. (2010) degrees in Mechanical Engineering from the INSA de Rennes, France. He joined ONERA as a research scientist in 2010. His research interests include modelling and identification of flexible robot manipulator, as well as non-linear control for redundant device with recent application on control moment gyro clusters for attitude control of agile satellites.