Light Science & Applications

Robotics Technologies for On-Orbit Assembly of Large Space Telescopes

Surrey Space Centre, UK

Angadh Nanjangud
Email: a.nanjangud@surrey.ac.uk

Space-based telescopes for astronomy offer a panacea to the imaging challenges faced by ground-based observatories such as light pollution, and atmospheric blocking of important bands of the electromagnetic spectrum. However, high-resolution space imaging systems require large primary optics which cannot be launched monolithically (e.g. Hubble Space Telescope) or deployed from a stowed configuration (e.g. James Webb Space Telescope). Instead, these large aperture mirrors must be assembled in orbit. While there are several architectures to assembling systems in space, autonomous robotic assembly with space manipulators offers the most immediately realistic and robust solution to the on-orbit assembly problem and is at the highest technological maturity. This talk will present an overview of the robotics and autonomous systems technologies such as sensing & perception, guidance, navigation & control (GN&C), microgravity mobility and mobile manipulation, and autonomy that will enable future robotic on-orbit assembly.

Short Bio:

Angadh Nanjangud is currently the Space Robotics Research Fellow at the Surrey Space Centre's STAR Lab in the University of Surrey. He was awarded a PhD by the University of California Davis in Mechanical and Aerospace Engineering for his research into the attitude dynamics of rocket-type systems. As a Google Summer of Code developer, he worked with the SymPy (**Sym**bolic **Py**thon) development team in enhancing the capabilities of its mechanics module which has been extended to a stand-alone package called PyDy (**Py**thon **Dy**namics). He recently spent a year as a visiting researcher at the NASA Jet Propulsion Laboratory in the Mobility and Robotics section's DARTS Lab. Here, his work was in the areas of computational multibody dynamics and modelling of deployable space structures. His current research is in space robotics for on-orbit assembly and servicing.