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Robotic evolution for the Human Lunar Base

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The human lunar base and human lunar exploration is going to be the next world wide space exploration target, after 30 years absence. In these 30 years, many technologies have been drastically advanced, especially in the robotics, computers, artificial intelligence, communications, and so on.

In consideration of the too severe lunar environment, such as the night temperature, space radiation, and so on, before the human base, the full utilization of those robotic technologies will be implemented and developed to support and build the safe, reliable, and affordable human lunar base.

In this presentation, we will discuss and propose the stepwise evolution scenario to the safe human lunar base, from the view points of robotic technologies. These steps will start with the international robotic village by the virtual collaboration, as the first step, and will reach the international human lunar base with many assistant and support robot systems as the lunar base infrastructure. Those robot systems will be large scale construction robot for the lunar base assembly, geological sample assembly robot for in-site resource utilization, maintenance and repair robot of the lunar base itself, assembly and maintenance of the scientific equipments with delicate fingers or end effectors, and so on. These lunar base robots will be the next generation space robots after the ISS space robots and rover robots on the Mars.