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ACTIVITIES (D5)

Knowledge management for space activities in the digital era (2)

Author: Mr. Federico Monaco

Università degli Studi di Parma, Italy, federico.monaco@unipr.it

Mr. Antonio Del Mastro

Mars Planet, Italy, info@marsplanet.org

DEEP SPACE LEARNING – DISRUPTION TOLERANT NETWORKING (DTN) FOR
INTERPLANETARY COMMUNITIES OF PRACTICES

Abstract

Distance and asynchronicity are relevant issues and reverse salients in space communication performances as much for humans as for technological systems. A beknown space program about Delay Disruption Tolerant Networking (DTN) is under development. In considering the feasibility and design of a deep space internet for Earth, Moon, Mars and beyond, space lag may be overcome with point-to-point data transfer by a different internet protocol not based on instantaneous connection of two points. Although, given communication interruption and data disruption, such different protocol will guarantee data packet delivery only every time the next communication path will open. Given the need for a scientific approach to learning, possibly researched by quantitative and qualitative methods, Deep Space Learning might be taken in consideration as a field of research on simulation in designing and delivering teaching, learning and collaboration for space and off world exploration. An italian association for the exploration of Mars -Marsplanet- has been active in researching in the field of communities in extreme environments and virtual reality. Next step is a learning program to increase fidelity in simulation and analog missions, where knowledge management and information sharing can make the difference for the success of the missions and survival of astronauts. The goal is a program of virtual and asynchronous learning for remote communities based on simulating long distance communication and Disruption Tolerant Networking. It involves experts and volunteers at many levels: vision, design, test and the benchmarking of the current virtual learning systems and networking solutions. The program includes the development of VR treadmills which are designed to offer new technological opportunities to investigate the human exploration of space. Space studies about the reaction time to new pieces of information and scaffolding knowledge should be given a proper attention in designing successful strategies for the innovation of learning in future missions.