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IAF SPACE EDUCATION AND OUTREACH SYMPOSIUM (E1)
Lift Off - Secondary Space Education (2)

Author: Mr. Kyunghwan KIM
International Space University (ISU), France, kyunghwan.kim@community.isunet.edu

Mr. Hongjik JANG
Korea, Republic of, makerdaniel503@gmail.com

STEM EDUCATION USING SPACE ROVER AND STUDENT ROVER CHALLENGE(SRC)

Abstract

A complex knowledge base is required in the field of space engineering and science. However, it needs more of an interdisciplinary approach to achieve a successful mission. In STEM education, students learn and apply concepts from science, technology, engineering, and mathematics. Generally speaking, one of the biggest challenges of STEM instruction is student engagement because of limited accessibility and boring lessons. This paper explains the methodology and results of STEM education using Space Rovers. Then the next upcoming program of the International Student Rover Challenge in late summer based on this education platform will be discussed. Since 2015, Pumpkin Idea Factory makerspace has provided a makerspace for young students aged 6 to 16 in Busan, South Korea. Mr. Jang, a founder of the makerspace was a mathematics teacher at a private institute until 2022. The initial purpose of the institution was to give interest in mathematics to students by making models, for example, submarines, karts, and rovers. In response to this creative experience, students who did not enjoy mathematics became interested in learning complex programming, mechanical engineering, and science in order to construct a space rover and a drone with extensive experience. Moreover, this experience led them to develop an interest in space engineering and exploration as a result of this education. The makerspace has overcome the issue of limited accessibility by using recyclable materials, such as PVC pipes and other low-cost materials. Arduino is also used for ease of understanding and making complex systems. Additionally, students have gained skills related to problem-solving and teamwork as a result of our educational program. Based on this successful education approach, we are preparing an international Student Rover Challenge for young students that offers extensive test terrain for students to compete with other students. As a first step, we aim to familiarize young students with STEM subjects as well as space exploration rovers. Second, we aim to offer a place and educational networking for the young generation to experience space exploration and self-problem solving with mentors in order to cultivate future space generations.