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Author: Mrs. Victoria Letertre
Space Engineering Center (eSpace), Ecole Polytechnique Fédérale de Lausanne (EPFL), Switzerland

GROWBOTHUB - AUTOMATED VEGETABLES GROWTH FOR LUNAR HABITAT

Abstract

The GrowBotHub project is an interdisciplinary project aiming at automated growth of vegetables for extreme environments. This project started in October 2018.

The project aims at growing vegetables autonomously with aeroponics and a robotic arm, with help of machine learning on a top-level controller and computer vision. In order to make sure the growth goes well, we use sensors and computer vision, then the robotic arm comes and harvests/disposes the vegetables ready to be consumed.

It has been proven that having access to fresh vegetables can greatly improve the mental health of the astronauts. Having food production systems will also be necessary for long term missions. Aeroponics reduces greatly the amount of water and nutrients required to grow vegetables. We are now focusing on vegetables that don't produce a lot of waste and have taste (peppers, basil..).

GrowBotHub wishes to be able to provide 25

Our team is composed of EPFL (Swiss Federal Institute of Technology in Lausanne) students with different backgrounds (from life science engineering to data science, going through robotics, mechanical and microtechnics engineering). We are now starting to work on aeroponics in micro-gravity, as our aeroponic system will be affected by Space environment with a focus on water containment and dispersion. In parallel, we work on the improvement of the top-level controller, sensors integration, aeroponics and robotic harvesting. We are working on two types of system using the same electronics and aeroponics. One is meant to grow root vegetables like potatoes and the other is meant for leaf vegetables (basil, peppers, lettuces, spinach..). We are using robotic harvesting and computer vision for both systems.