National Institute of Technology Calicut

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Innovative Projects: Abstract

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Title of the Project	Robot Based Automation for Vertical Farming
Abstract (Max. 250 words)	Agriculture is one of the most important sectors in the Indian economy. In agriculture sector vertical farming involves growing crops in a controlled environment which aims to optimize the plant growth and implement soilless farming techniques which is space and water efficient. Hydroponics uses 90% less water for farming compared to the traditional agriculture. Implementation of robots instead of human beings in agriculture will be very useful as it reduces human effort and labour in farming to a great extent. The aim of this project is to build a prototype of a robot based automated vertical farm by developing a serial mobile manipulator with a multi-purpose end effector for planting and harvesting of the crops and development of a lift to enable the manipulator to reach higher stacks. Besides the development of a robotic manipulator, another objective is to completely automate the farming activities such as planting, inspection and harvesting with minimum or zero human intervention using computer vision techniques and deep learning algorithms.

Novelty of the Project	• Complete automation of vertical farming including planting, inspection and harvesting using one mobile manipulator. • Multi-purpose end effector for planting and harvesting.