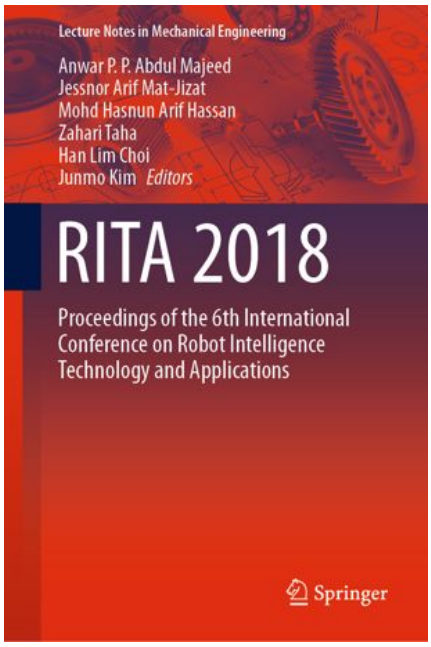

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Contents

Design of Fast Climbing Robot for Tree with Multiple Diverging Branches

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Abstract:
There are various situations where climbing of a tree without the use of cranes or ladders are needed, such as the collection of seed and leaf samples of wild trees in the jungle by geneticists and forest managers, and the harvest of fruits or bee hives for natural honey. The use of robots is limited by the existence of branches on a tree as it prevents the use of simple climbing mechanics. In this paper we designed a novel tree climbing robot to climb a tree with multiple diverging branches. The scope of the tree for the design are tree height 2.4 m, trunk diameter range between 0.13 and 0.26 m and branch diameter range of between 0.07 and 0.10 m. Various tree climbing methods were studied and compared to select the method that most closely fulfills a set design principle for a climbing robot. The mechanical design of our tree climbing robot combines wheel mechanism with interlock gripping mechanism to allow for maneuverability around a tree trunk to navigate between tree branches. Analysis was done using CAD software to help in designing the parameters of the climbing robot..

Keyword: CAD Software; Multiple Diverging; Forest Managers