

Analysis of a Single Motor Finger Mechanism for a Prosthetic Hand

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Abstract : This work analyzes a finger mechanism for a prosthetic hand that will help in improving the living standards of people who have lost their hands for a variety of reasons. The finger mechanism is single degree of freedom and hence has advantages such as compact size, reduced mass and less energy consumption. The proposed finger mechanism is a six bar linkage actuated by a single motor. The kinematic, static and dynamic analyses have been done by using the conventional methods of mechanism analysis. The kinematic results present the motion of the proposed finger mechanism and location of the fingertip. The static and dynamic analyses provide the useful information about the gripping force at the fingertip for various configurations and the selection of motor that will move the finger over its range of configuration. This single motor finger mechanism is simple and resembles the human finger's motion suitable for grasping operation. This study can be used in the optimization of geometrical parameters of the proposed mechanism to obtain the desired configurations with minimum torque and enhanced gripping.

Keywords : dynamics, finger mechanism, grasping, kinematics

Conference Title : ICMME 2016 : International Conference on Mechanization and Mechatronics Engineering

Conference Location : Montreal, Canada

Conference Dates : May 16-17, 2016