Parallel Mechanism based Rehabilitation Device for Neck Pain

Dr Arockia Selvakumar Arockia Doss
Senior Associate Professor, Design and Automation Research Group, SMEC
Vellore Institute of Technology, Chennai, TN, India

This research aims to design and develop a novel parallel mechanism based cervical collar device to help patients suffering from neck pain. Further this research is focussed on elderly people to create movements on the neck for various motions. The proposed and developed parallel mechanism consists of 3 RPS (Revolute – Prismatic – Spherical) joints. The dimensional analysis is carried out based on geometrical parameters of the parallel mechanism based on logical approach. Based on the kinematic equations the position and workspace analyses are carried out. The mechanism is simulated in MATLAB to validate the position and workspace analyses results. Further preliminary experimental studies are carried out based on various motions of neck. Based on the studies, it is found that the developed rehabilitation device can be used effectively to neck pain patients.