

## Parametric Study of Ball and Socket Joint for Bio-Mimicking Exoskeleton

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**Abstract :** More than 11% of people suffer from weakness in the bone resulting in inability in walking or climbing stairs or from limited upper body and limb immobility. This motivates a fresh bio-mimicking solution to the design of an exo-skeleton to support human movement in the case of partial or total immobility either due to congenital or genetic factors or due to some accident or due to geratological factors. A deeper insight and detailed understanding is required into the workings of the ball and socket joints. Our research is to mimic ball and socket joints to design snugly fitting exoskeletons. Our objective is to design an exoskeleton which is comfortable and the presence of which is not felt if not in use. Towards this goal, a parametric study is conducted to provide detailed design parameters to fabricate an exoskeleton. This work builds up on real data of the design of the exoskeleton, so that the designed exo-skeleton will be able to provide required strength and support to the subject.

**Keywords :** bio-mimicking, exoskeleton, ball joint, socket joint, artificial limb, patient rehabilitation, joints, human-machine interface, wearable robotics

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