



Revitalization of Mechanical Technologies in Disability and Health care

Applications: A Research agenda

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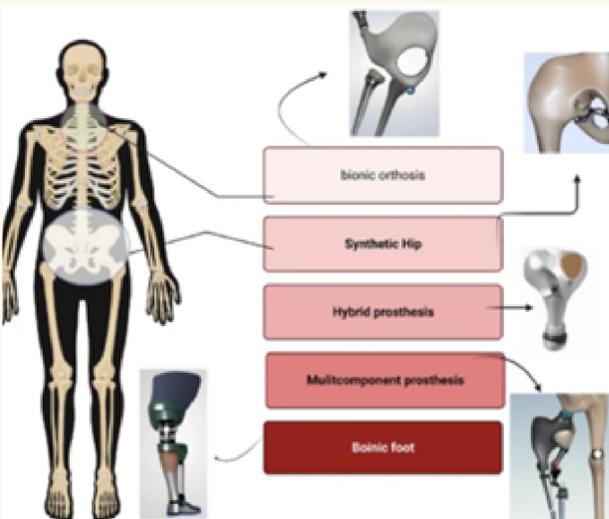
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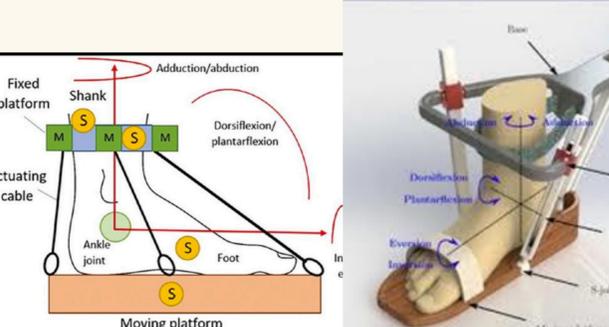
Affordable Indigenous Orthopedic Prosthesis

Designed cost-effective lower limb (FOS > 1.5)



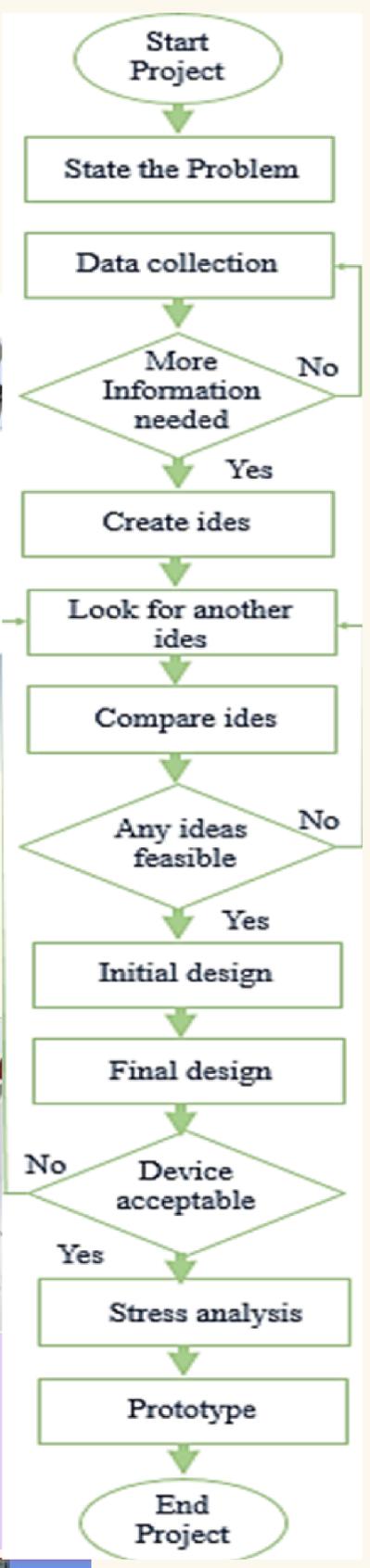
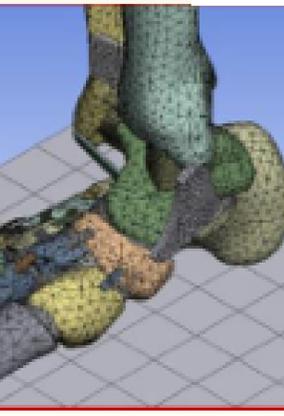
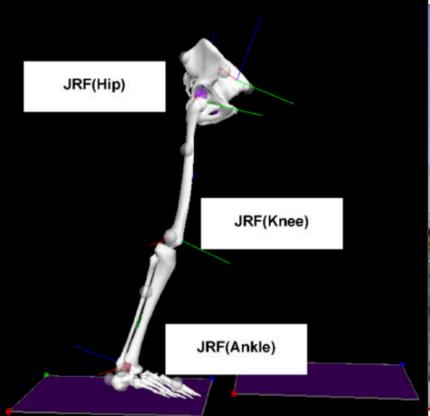
Cable-Driven Ankle Rehabilitation Robot

Developed cable-driven wearable robot for ankle rehabilitation



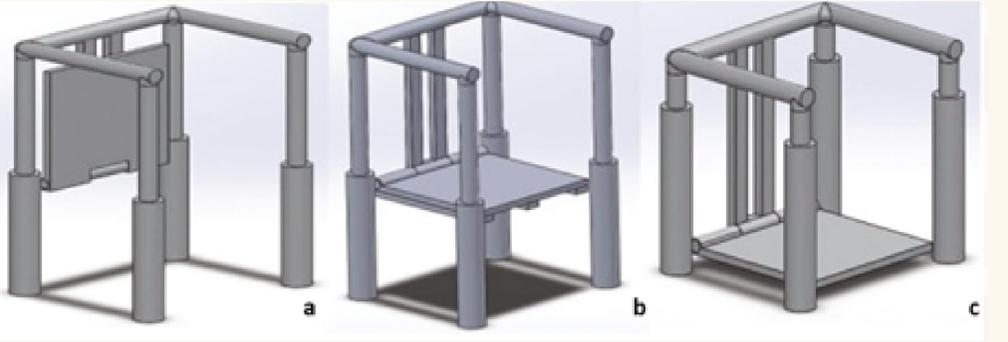
Ankle Biomechanics on Inclined Surfaces

Analyzed ankle biomechanics on slopes using 3D FEA.



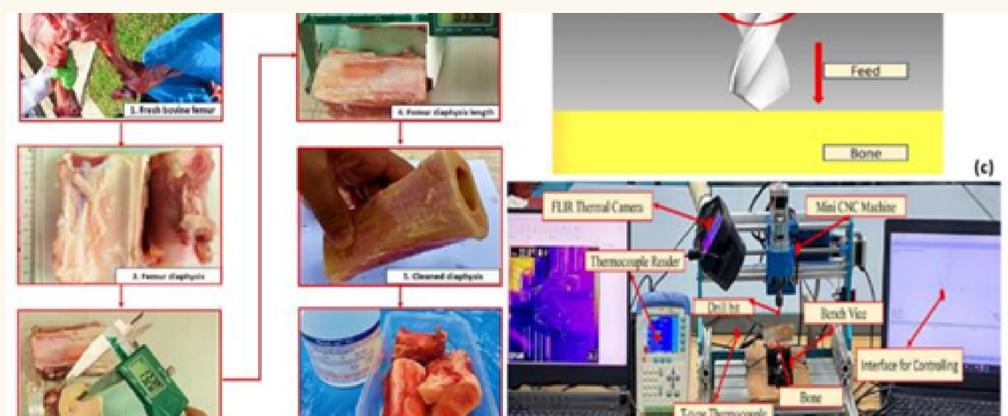
Design of an After-Fall Assistive Device

Designed FEA-validated elderly lift supporting 142 kg



Machine Learning for Safe Bone Drilling

Optimized bone drilling via ML to prevent necrosis.



Synthetic Pediatric Spine for Biomechanical Investigation



Modeled pediatric spine via FEM to evaluate scoliosis.

Assistive devices and Technology to Facilitate Activities :Overview of personnel research collaborations

- 1. Design Optimization and Integrated Simulation Analysis of a Cable-Driven Ankle Rehabilitation Robot M.F. Ijaz et al., JDR. 2023, Vol. 2(2):89-99. DOI: 10.57197/JDR-2023-0027
- 2. A prospective Outlook on the development of exoskeletal knee joints for Prostheses via a Design Concept evaluation Approach M.F. Ijaz et al., JDR. 2023, Vol. 2(1):47-62. DOI: 10.57197/JDR-2023-0006
- 3. Supervised Machine Learning to Predict Drilling Temperature of Bone M.F. Ijaz et al., https://doi.org/10.3390/app14178001
- 4. Correlation between Postural Stability and Lower Extremity Joint Reaction Forces in Young Adults during Incline and Decline Walking M.F. Ijaz et al., https://doi.org/10.3390/app132413246
- 5. Design of an After-Fall-Assistive Device for Elderly Patients by Finite Element Methods DOI: 10.14293/PR2199.000172.v2
- 6. The Development of Rehabilitation Orthotic Walker with a Real Time Visual Feedback System of the Gait Symmetry
- 6. Finite Element Modelling of a Synthetic Paediatric Spine for Biomechanical Investigation M.F. Ijaz, https://doi.org/10.3390/ma16134514
- 6. Stability Analysis of Plate-Screw Fixation for Femoral Midshaft Fractures M.F. Ijaz https://doi.org/10.3390/ma16175958

