



Project Proposal for Ph.D.

Project Details

Project Title	Electromyography-informed locomotor behavior in children with developmental disorders
Project Summary (Minimum 500 and maximum 2000 characters)	Electromyography (EMG) is a technique that measures the electrical activity of muscles during movement. This is done by placing small electrodes on the surface of the skin over the muscle being studied, which detect the electrical signals generated by muscle contractions. By analyzing EMG data, researchers can gain insights into the timing, intensity, and duration of muscle activation during different movements. EMG can be used to study a wide range of locomotor behaviors, including walking, running, jumping, and stair climbing. It can also be used to evaluate the effects of various interventions, including physical therapy, orthoses, and surgery. The specific objectives of Electromyography (EMG)-informed locomotor behavior in children with developmental disorders are to: 1. Assess muscle activation patterns during locomotor activities 2. Identify differences in muscle activation patterns between children with and without developmental disorders 3. Determine the effectiveness of interventions 4. Development of new interventions Overall, this project would deepen our understanding the neuro-musculoskeletal mechanisms in children with developmental disorders.

Ph.D. Supervisors

Role	Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Dr. Kaushik Mukherjee	Mechanical Engineering	kmukherjee@mech.iitd.ac.in
Supervisor 2	Prof. Rajesh Malhotra	Chief, JPNA Trauma Centre, AIIMS, New Delhi; Professor & Head of Orthopaedics at AIIMS New Delhi	rmalhotra62@gmail.com

Project requirements (Student qualifications, experience required, etc)

- UG in Electrical Engineering/Electronics and Communication Engineering/Electronics Engineering/Electronics and Instrumentation Engineering/Electronics and Telecommunication Engineering or allied department with PG in Biomedical Engineering or Biological Sciences or allied specializations
- Knowledge of Gait and motion analysis, myography signal analysis, musculoskeletal modeling package (OpenSim/AnyBody)

Source of fellowship/funding

(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Candidate with his/her own fellowship or part-time

Role of Faculty Members involved:

Dr. Kaushik Mukherjee will be involved in mentoring the research activities related to the biomechanical evaluation, musculoskeletal modelling.

Prof. Rajesh Malhotra will be involved in mentoring the research activities related to the subject recruitment and treatment policy.