



Project Proposal for Ph.D.

Project Details	
Project Title	Developing computational tools to dissect the mutational landscape of genomic disorders in India
Project Summary (Minimum 500 and maximum 2000 characters)	There is a dearth of Indian population specific databases for genetic variants pertaining to genomic disorders such as cancer and genetic abnormalities. The largest studies done on Indian patients cover only 100s patients and are not well-powered to either enumerate known mutational frequencies or discover new India-specific mutations. Currently, one of the limitations for achieving higher patient numbers is the speed of the computational pipelines used. In this project, we plan to address this limitation by building state-of-the-art computational pipelines that are complemented with advanced graph-based machine learning to enumerate and annotate clinically relevant mutational signatures. We will apply these pipelines to the largest cohort of patients genomic and imaging data in India to enumerate the landscape of mutations in cancer and fetal aneuploidies from clinical genomics assays.

Ph.D. Supervisors			
Role	Name of Faculty	Academic Unit in IITD/Institute/University	Email ID (Official)
Supervisor 1	Ishaan Gupta	DBEB	ishaan@iitd.ac.in
Supervisor 2	Sandeep Kumar	EE	ksandeep@ee.iitd.ac.in

Project requirements (Student qualifications, experience required, etc) *The candidate will be shortlisted based on common shortlisting criteria decided by ScRC (SIRe)
- B.Sc., M.Sc. Zoology, Biotechnology, Life Sciences from Central University or CFTI - Valid GATE score, UGC-NET cleared 2-years of hands-on experience in Bioinformatics. The candidate is expected to have expertise in Bash, Python, Genomics and Machine learning. The candidate must have experience in processing clinical genomics samples.

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

Role of Faculty Members involved:	
Supervisor-1	Genomics, Bioinformatics, Cancer Omics data interpretation
Supervisor-2	Machine learning, Graph theory, Computer vision for clinical image data analysis