Biomedical Engineering

भारतीय प्रौद्योगिकी संस्थान हैदराबाद
Indian Institute of Technology Hyderabad

Where the boundaries between disciplines fade !

PhD Admissions Brochure

(July 2023)

PhD Admissions @ Biomedical Engineering

The Department of Biomedical engineering at Indian Institute of Technology Hyderabad (IITH) welcomes applications from suitably qualified and highly motivated students, willing to pursue research in the following research areas.

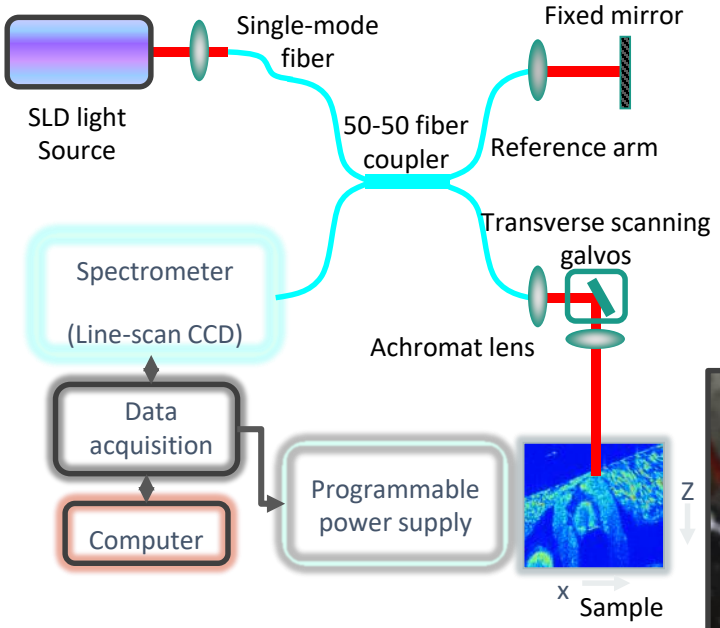
- Biomedical Imaging
- Biomicrofluidics & Biomechanics
- Regenerative Medicine & Stem Cell Research
- Nano Medicine & Regenerative Medicine
- Computational Neurosciences
- Bio-nanotechnology & Nanomedicine
- Biofabrication & Tissue Engineering
- Neurotechnology & Neuroscience
- Computational Systems Biology and Biomechanics
- Ultrasound Imaging & Therapeutics

IITH Hostels

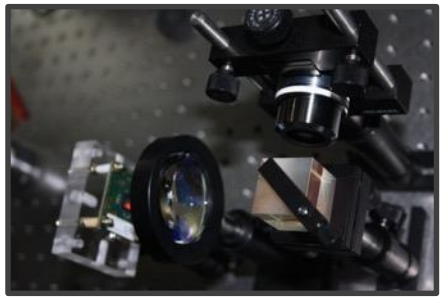
Biomedical imaging

Dr. Renu John

- Novel non-invasive bio-imaging techniques
- Coherence imaging and microscopy techniques
- Molecular contrast agents and Targeted molecular imaging
- Nanoparticles
- Targeted drug delivery and Bio-photonics applications



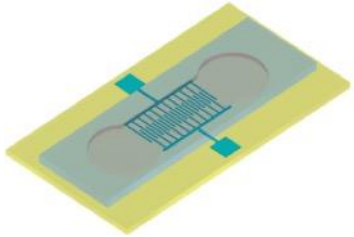
Lab website



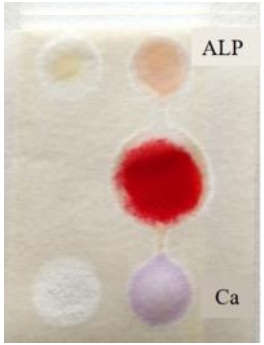
Biomicrofluidics and Biomechanics

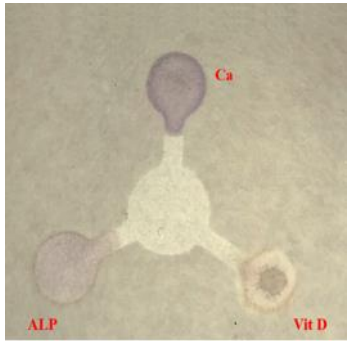
Dr. Harikrishnan Narayanan Unni

- Microfluidics and Lab on Chip for Bioengineering
- Lab on Chip for protein aggregation modelling
- Computational Biophysics and Systems Biology
- Computational Biomechanics

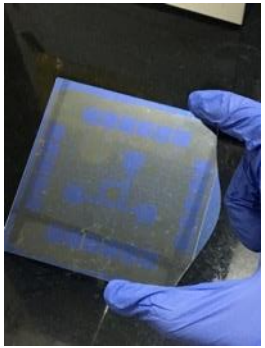


DEP Microfluidic Device

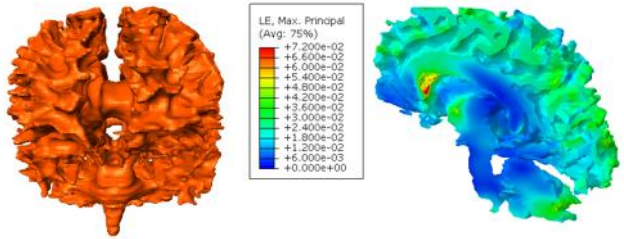




muPADs- Paper analytic devices



EWOD Electrode patterns



White matter Strain distribution – impact loading – FEM study

Regenerative Medicine & Stem Cell (RMS)

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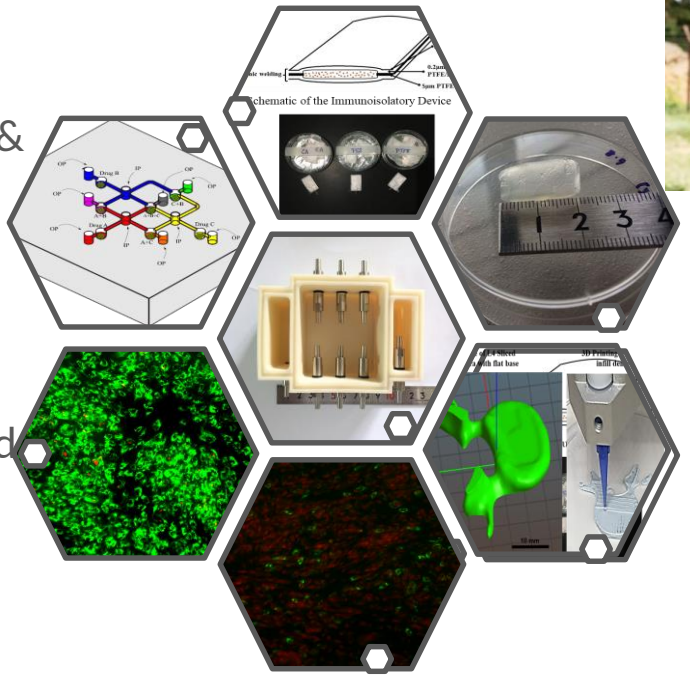
Indian Institute of Technology Hyderabad

Dr. Subha Narayan Rath

Lab website

- Stem cells and bioengineered devices for diabetes and tissue regeneration.
- Bioengineering strategies and use of adipose- & umbilical cord-derived stem cells for diabetes, vascularized and osteo-chondral tissues, using bioreactor forces and 3D bio-printing.
- 3D printed microfluidic device for personalized medicine especially, anti-cancer drug testing.

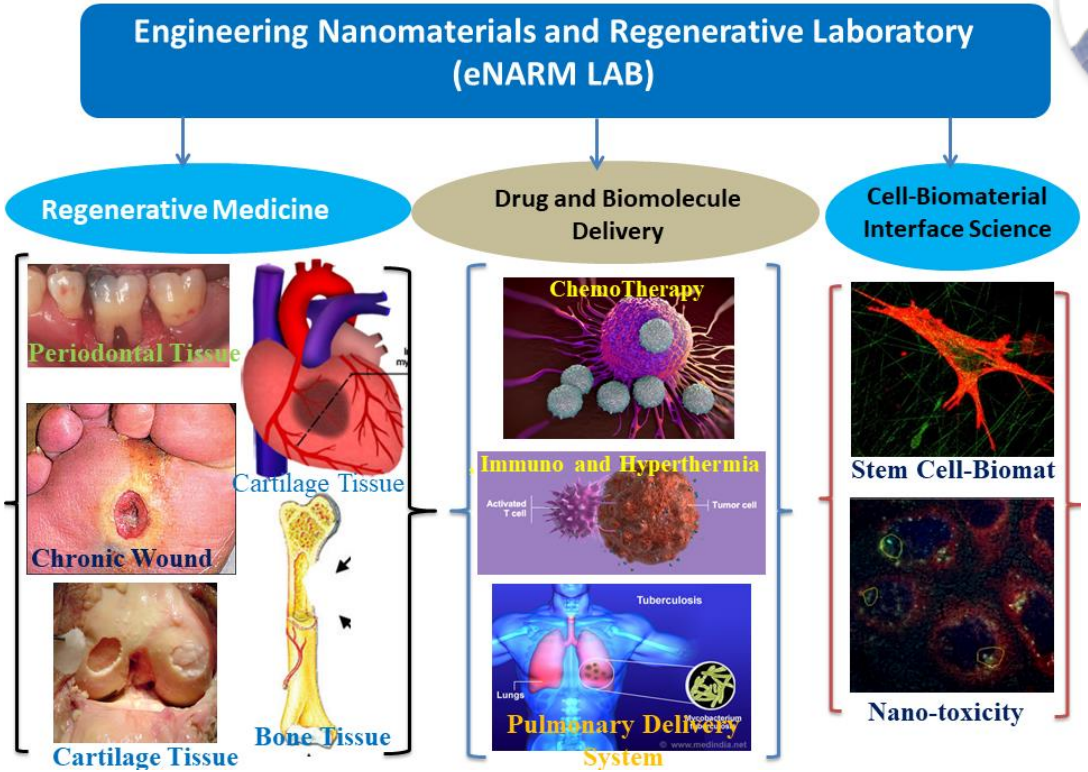


Nano Medicine & Regenerative Medicine

Lab website

Dr. Jyotsnendu Giri

- Novel Biomaterials for Tissue Engineering
- Micro/nano system for vaccine development
- Immunoengineering
- Cancer therapeutics
- Stem Cell Engineering
- Drug Delivery



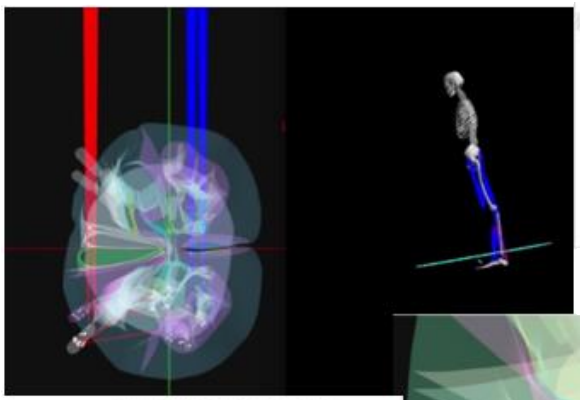
Computational Neurosciences

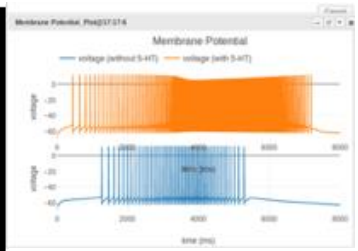
Dr. Mohan Raghavan

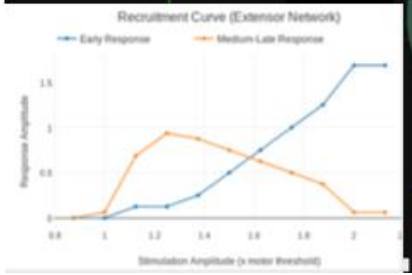
Spine Labs is focused on developing platform technologies around Neural simulation of human motor circuitry and afferent fibres. We use these simulation based technologies for advancing

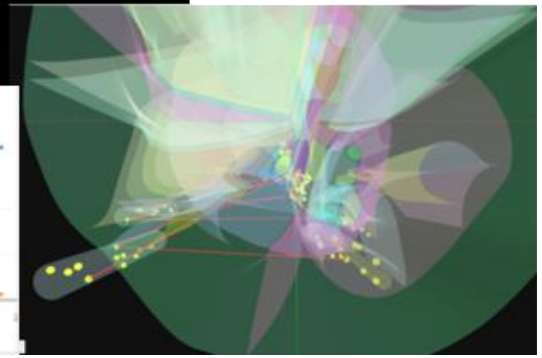
- Clinical Practice & Medical device development
- Robotics and Neuromorphic technologies
- Basic science and Education

Note: Candidates with a background in programming, mechanical engg or any other quantitative sciences are preferred!!









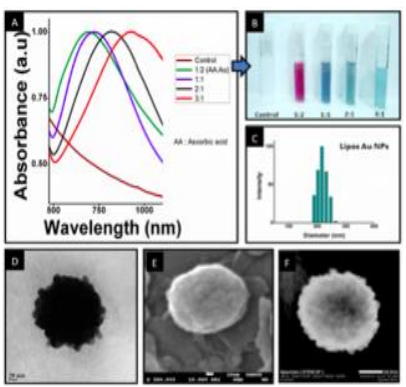
Lab website

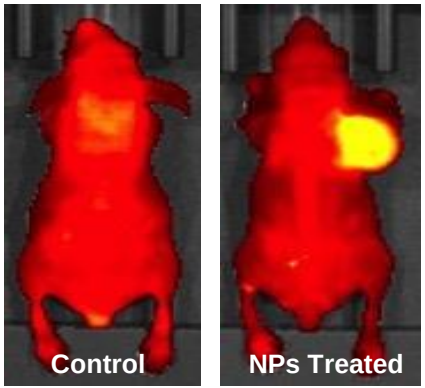
Bio-nanotechnology and Nanomedicine

Dr. Aravind Kumar Rengan

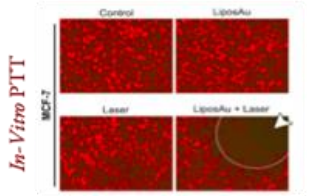
- Cancer Nanotheranostics
- Nanotoxicology
- Biomaterials
- Triggered/Targeted Drug Delivery
- Radiation Biology
- Anti Microbial Resistance

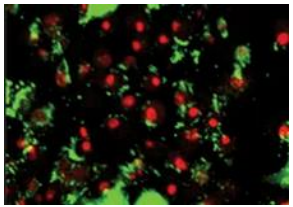
Targeted Nano Theranostics

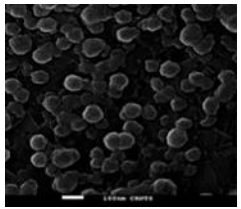


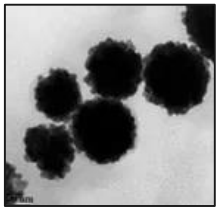


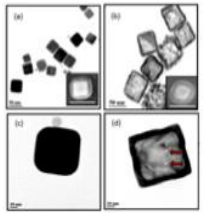
Lab website

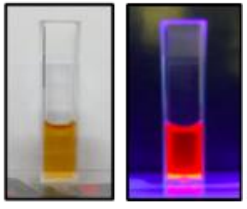


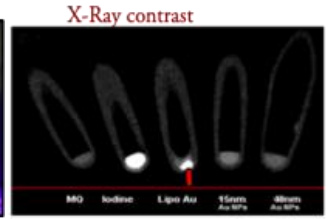












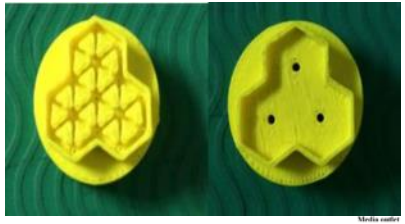
Biofabrication and Tissue Engineering

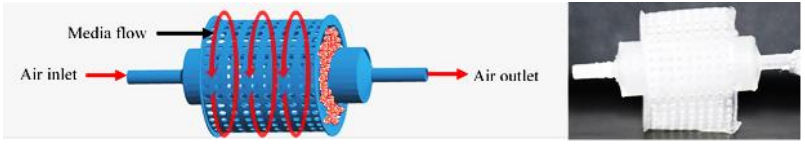
Dr. Falguni Pati

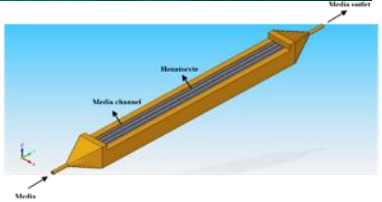
- 3D bioprinting of tissue/organ constructs for tissue engineering and regenerative medicine
- *In vitro* tissue/organ models for fundamental study and drug/toxicity testing
- Development of novel bioprintable biomaterial and bioink formulation
- 3D cell and tissue printing for personalized medicine
- 3D printed customized and personalized orthosis and prosthesis

Lab website

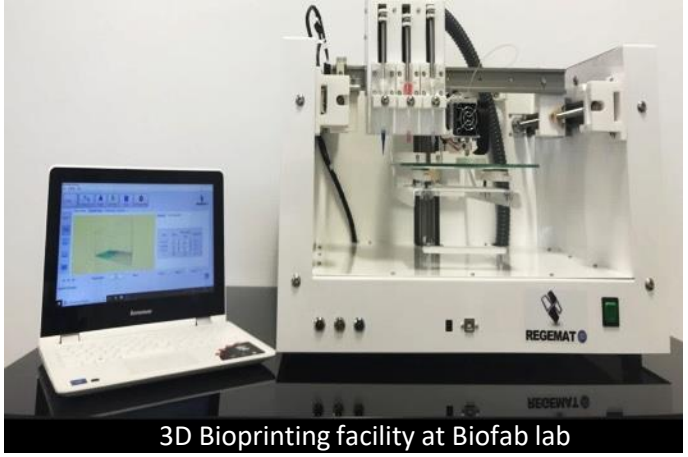
Tissue/Organ-derived bioink for 3D bioprinting







CAD Model and 3D printed structures of next generation miniature bioreactor



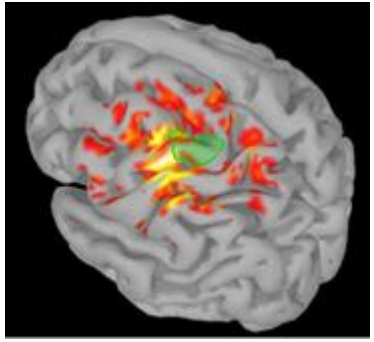
3D Bioprinting facility at Biofab lab

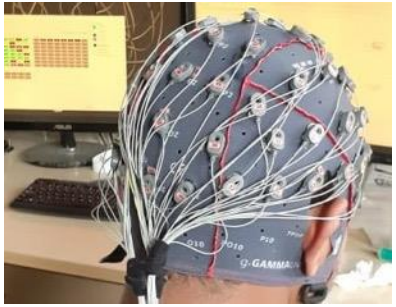
Neurotechnology and Neuroscience

Dr. Kousik Sarathy Sridharan

- Neuroimaging of the brain & peripheral electrophysiology
- Invasive and non-invasive neuromodulation for neurological and psychiatric disorders
- Intraoperative Neuromonitoring support systems

Lab website





Stroke rehabilitation

Intra-opertative neuromonitoring

Disorders of consciousness

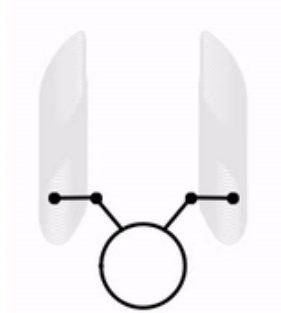
Diagnostics for neuromuscular disorders

Computational Systems Biology and Biomechanics

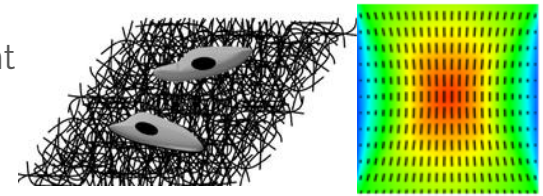
Dr. Mohd Suhail Rizvi

We utilize theoretical and computational approaches to study the biological systems in physiological contexts as well as in their engineered analogues. Our research focus includes

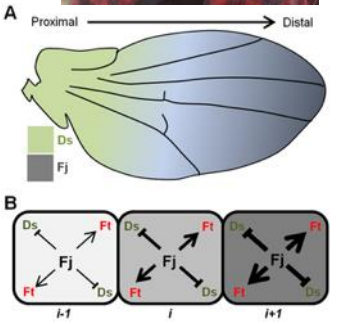
- Constitutive modeling of biomaterials
- Mechanics of active suspensions
- Systems biology of embryonic development
- Mechanotransduction in tissue engineering



Mechanics of algal swimming



Model of electrospun fibers



Mathematical model of Planar Cell Polarity

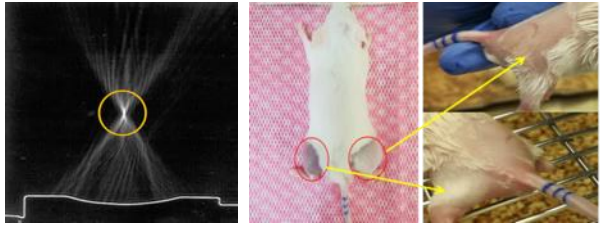
Ultrasound Imaging & Therapeutics

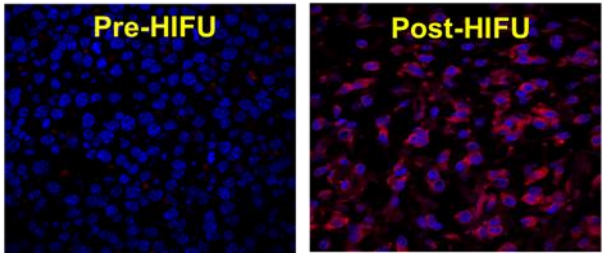
Dr. Avinash Eranki

My lab is focused on developing:

- Image-guided Therapeutic Ultrasound (FUS/HIFU) techniques for cancer therapy
- Liquid biopsy using Focused Ultrasound
- Ultrasound-based drug delivery
- Ultrasound Imaging for musculoskeletal applications & placental & fetal applications

Therapeutic Ultrasound for Cancer Therapy





Ultrasound for Maternal/Fetal & Rehabilitation Applications

Biomedical Informatics & Healthcare

Dr. Nagarajan Ganapathy

My lab is focuses on the solutions for

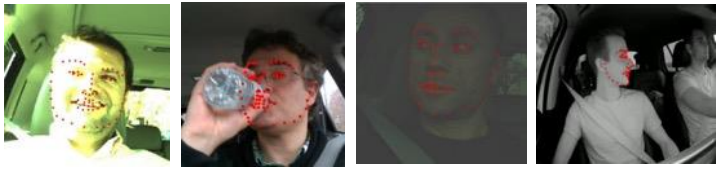
Digital Health / Artificial Intelligence (AI) for healthcare / Machine Learning / Pattern Recognition/ Explainable AI

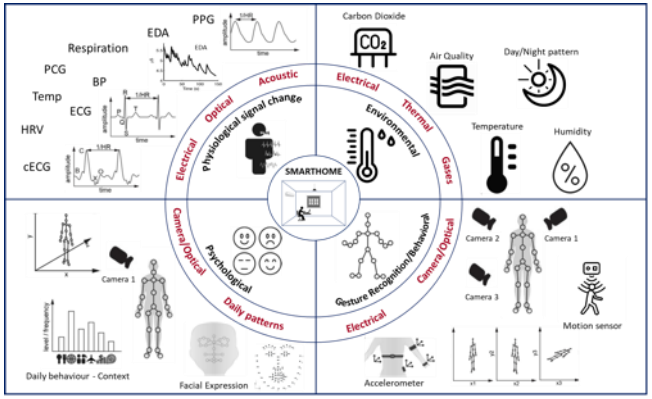
Affective Computing / Pervasive computing / Mental Health / Human Wellbeing / Behaviour analytics

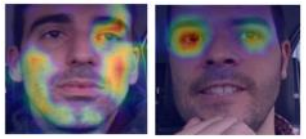
Biomedical Informatics Lab

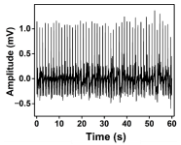
Biomedical Devices / Wearables / Sensors/ Imaging / Biomedical Signals and Imaging Analytics

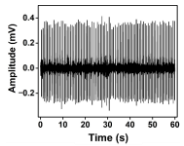
Internet of medical things / Smart spaces / Big Data – Privacy, Ethics / Regulations and medical standards

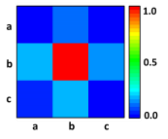


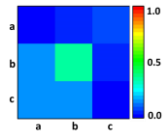


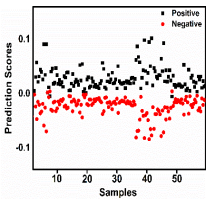


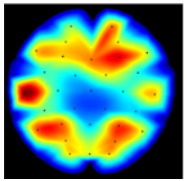












Eligibility criteria

1. M.Tech./M.E./M.S.(Engineering/Technology)/MSc/MBBS/BDS degree in the respective or allied areas
2. Candidates with Bachelor's degree in Engineering/Technology or Master's degree in Sciences in an allied area and possessing a valid GATE score may also apply
3. For those who have not yet completed their qualifying examination, marks up to the 7th semester/ 3rd year (for B.Tech students) and 3rd semester/ 1st year for PG students will be considered
4. Candidates with CSIR-NET-JRF / UGC-NET-JRF award for Research fellowship or equivalent or GATE Qualification are encouraged to apply
5. Please note that a stringent criteria may be used based on the marks in previous degrees in short-listing candidates to be called for interview.

General information

- Applicants working in reputed R&D Organizations/Laboratories are eligible to apply
- Such applicants (a) need to be deputed on leave by the parent organization/department (b) do not require GATE qualification, and (c) will not be paid any assistantship or scholarship by IIT Hyderabad.
- Selection process is purely merit based and candidate will be tested in interview
- Application fees and details are available on IITH web page (www.iith.ac.in)
- Create login id and apply online on IITH website www.iith.ac.in/phdadmissions

Contact details

Dr. Aravind Kumar Rengan / Dr.Mohd Suhail Rizvi

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Email: bme_admissions@iith.ac.in

www.iith.ac.in

https://bme.iith.ac.in/