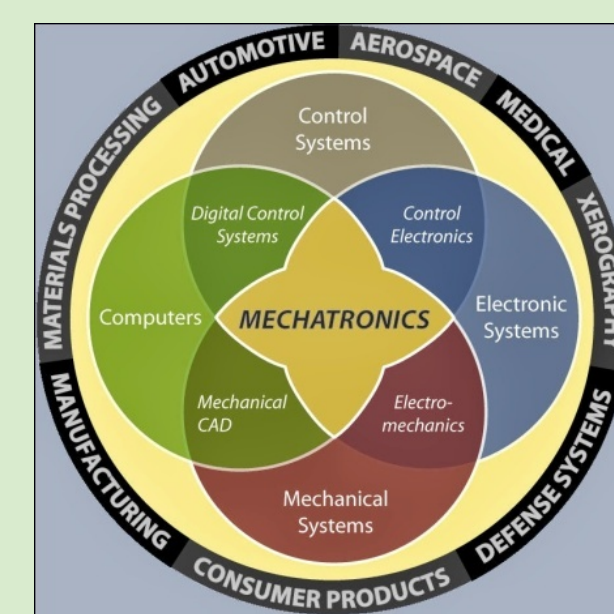


# RESEARCH ACTIVITIES

## School of Mechatronics and Robotics

### Indian Institute of Engineering Science and Technology, Shibpur



#### Brief History

- The beginning of this century is marked with multi-disciplinary technological advancement which has not only revolutionized Indian and global industrial market but also has put an impact on engineering education system.
- BESUS responded (2006) to the changed technology scenario by introducing a new specialized multidisciplinary engineering school - School of Mechatronics & Robotics.



#### Research Publications

- International Journal of precession engineering and manufacturing (Springer)
- Sensors and Actuators A Physical (ELSEVIER)
- Electronic Letters ( IET)
- Mechanism & Machine Theory (ELSEVIER)
- Procedia Computer Science (ELSEVIER)
- Soft Computing Techniques in Engine application, Studies in Computer Intelligence (Springer)
- Journal of Intelligent Robotic System
- Mechanics based Design of Structure & Machines, Taylor & Francis
- International Journal of Bio-Mechatronics & Bio-mechanical Robotics, (Inderscience Publishers)
- Advanced Materials Research, (Trans Tech Publications)

#### Collaboration with National Research Laboratories

- Central Scientific Instruments Organization (CSIR-CSIO), Chandigarh
- Central Mechanical Engineering Research Institute (CSIR -CMERI) Durgapur
- Central Electronics Engg. Research Inst. (CSIR-CEERI), Pilani

#### Visitors



#### Academic Programme

2 Year Full Time Collaborative M-Tech Programme (Student Intake Per Year: 18)  
Summer research fellowship programme  
Achievements :IE(I) student research project award, ATC-DRDO (DRDL-JU) student award, ISTE – L&T student award  
Opportunities: Student funded project, higher studies - PDF , Faculty position in IIT, live projects in CSIR labs.  
Strength: Hardware Oriented Research and Developmental activity.

#### Doctoral Programme

Degree Awarded: 4  
Submitted: 2  
Ongoing: 3  
ILD Program: Hiroshima University Japan  
Achievements :IE(I) student research project award, ATC-DRDO (DRDL-JU) student award, ISTE – L&T student award  
Opportunities: Student funded project, higher studies - PDF , Faculty position in IIT, live projects in CSIR labs.  
Strength: Hardware Oriented Research and Developmental activity.

#### Laboratory Facilities for Research



- Mechatronics Lab
- Robotics and Automation Lab
- Bio-Robotics, Haptics, VR Lab
- Smart Sensor and Actuator Lab
- Bio-Signal Processing Lab
- Bio-mechanics Lab
- Rehabilitation Robotics Lab
- Additive Manufacturing
- Control System Lab
- Automation Production System
- Design Innovation Lab
- Rural Tech. Development Lab

#### Products Developed



2. Brain Controlled lower limb exoskeleton device for mobility regeneration



3. Active Multi Modal Lower Body Exoskeleton for Mobility Enhancement and Regeneration



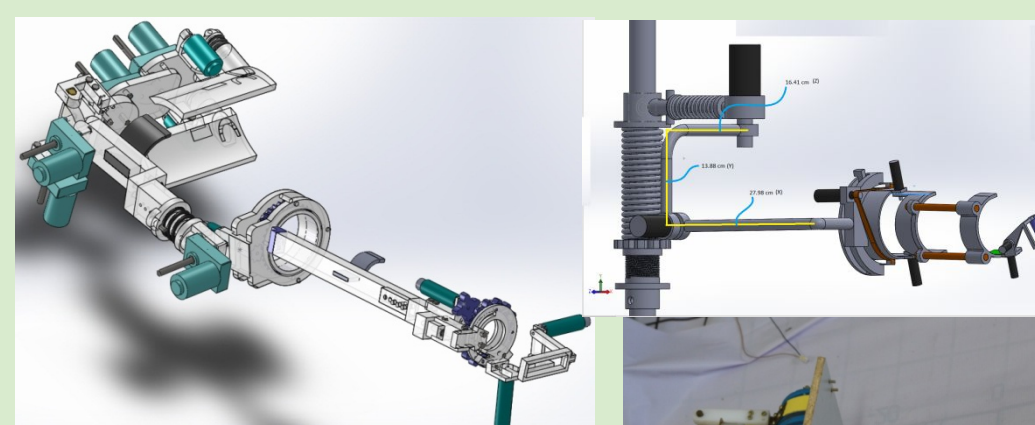
4. Multimodal Intelligent Wheelchair Based Transporter for Navigation in Dynamic Environment



5. Sensor Integrated Multi-Fingered Dexterous Robot Hand with Data Glove Interface



6. Autonomous Mobile Robot Vehicle for Stair Navigation



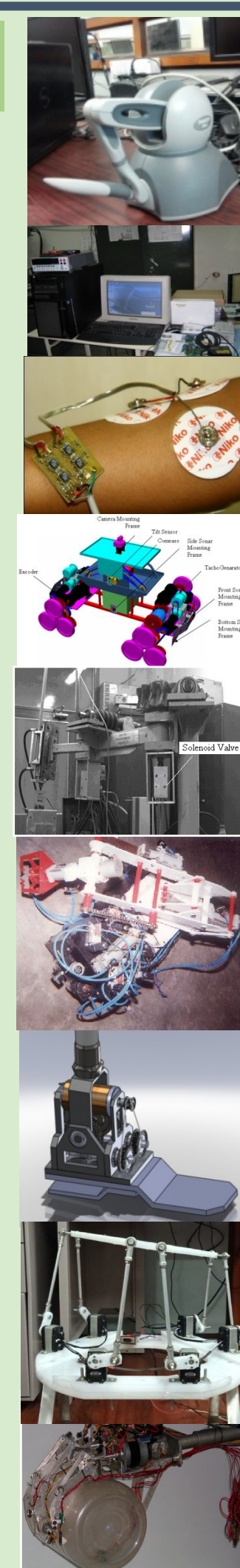
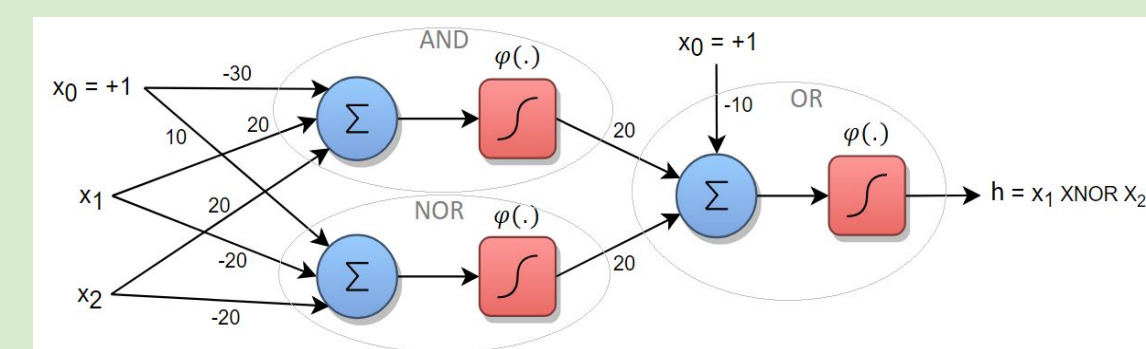
8. Continuum Robot

9. Blimp for Areal Surveillance



#### Multidisciplinary Research

- Mechatronics - Intelligent Innovative Product Development, bio-Mechatronics
- Robotics - Grippers, Sensors, Actuators, Image Processing, Bio-robotics
- Mobile Robotics - Path Planning , Navigation, Guidance and Control
- Orthotic and Prosthetic Devices / Bio-signal / Brain Computer Interface (BCI)
- Human Machine Interface / Cyber Physical System
- Industrial Automation, CAD/CAM
- 3D Printing
- Rural Technology
- Smart Material & Microgripper
- Soft Computing & AI
- Bio-mechanics and Human GAIT Analysis
- Virtual Reality (VR)
- Cognitive Science
- Dexterous Robotic Hand
- Teleportation
- AI and Soft Computing, Intelligent Systems



#### National Initiative on Design Innovation - Technology for Rural Development

1. Washing machines for rural usage
2. CNC Based Agricultural Robot for rural usage



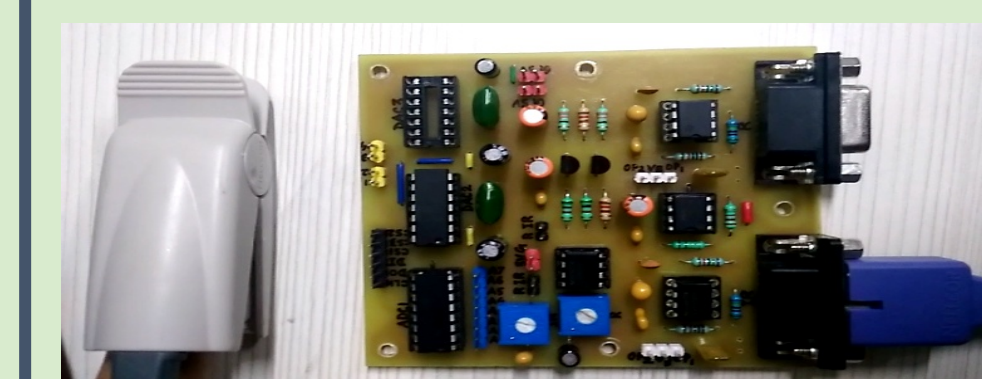
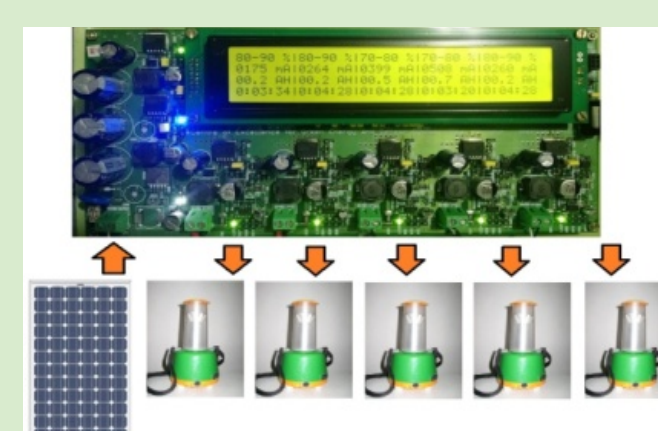
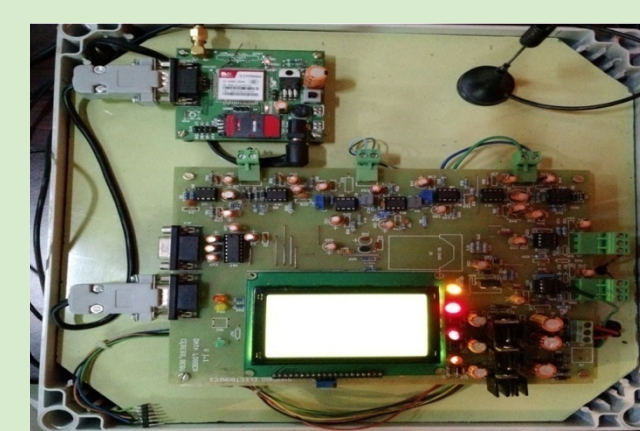
4. Compact low cost, field deployable soil parameter measurement system



3. Semi-Automatic Jute Fiber Extraction Machine



5. Solar Home Lighting System (LED lantern based solar home lighting system) and Solar Driven Drinking Water Supply System



6. Rural Health Monitoring Framework using Raspberry Pi and IBM WATSON IOT Platform

#### Funding Agencies

- BRNS, Dept. of Atomic Energy, Govt. of India
- Indo-US Centre for Research Excellence in Fabronics (IUCREF)
- University Grants Commission (UGC)
- SERB, Department of Science and Technology (DST)
- R&D, All India Council for Technical Education (AICTE)
- RPS, All India Council for Technical Education (AICTE)
- MHRD, Govt. of India

**Collaborators:** CSIR, CMERI Durgapur, HIT Haldia, NIOH Kolkata

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