

Shyam Sunder Nishad

Compliant and Robotic Systems Laboratory
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EDUCATION

2017–	Ph. D. in Mechanical Engineering Indian Institute of Technology Kanpur , India	CPI – 9.33/10
2013	M. Tech. in Mechanical Engineering Indian Institute of Technology Kanpur , India	CPI – 9.5/10
2008	B. Tech. in Mechanical Engineering Indian Institute of Technology Kanpur , India	CPI – 7.9/10

PUBLICATIONS

Peer reviewed Journals

- 2018 | Anirban Chowdhury, Shyam Sunder Nishad, Yogesh Kumar Meena, Ashish Dutta, Girijesh Prasad. **Hand-Exoskeleton Assisted Progressive Neurorehabilitation using Impedance Adaptation based Challenge Level Adjustment Method.** *IEEE Transactions on Haptics (accepted).*

Peer reviewed Conferences

- 2016 | Yogesh Kumar Meena, Anirban Chowdhury, Hubert Cecotti, KongFatt Wong-Lin, Shyam Sunder Nishad, Ashish Dutta, Girijesh Prasad. **EMOHEX: An Eye Tracker based Mobility and Hand Exoskeleton Device for Assisting Disabled People.** *IEEE SMC-2016, Budapest, Hungary.*
- 2015 | Shyam Sunder Nishad, Anupam Saxena, and Ashish Dutta. **Design and Control of a Three Finger Hand Exoskeleton for Translation and Rotation of a slender object.** *ASME IDETC/CIE-2015, Boston, USA.*
- 2015 | Anirban Chwodhury, Haider Raza, Ashish Dutta, Shyam Sunder Nishad, Anupam Saxena, Girijesh Prasad. **A study on cortico-muscular coupling in finger motions for exoskeleton assisted neuro-rehabilitation.** *EMBC-2015, Milan, Italy.*
- 2014 | Shyam Sunder Nishad, Ashish Dutta, and Anupam Saxena. **Design and Control of a Three Finger Hand Exoskeleton for Translation of a slender object.** *UARI-2014, Kuala Lumpur, Malaysia.*

Patents

- 2018 | Indian Institute of Technology Kanpur. **Hand orthosis for rehabilitation exercise post stroke.** *Indian Patent, Design Application No.304112, filed March 2018.*

Poster Presentation / Demonstration

- 2016 | Demonstrated **EMG-controlled hand exoskeleton prototype**, in exhibition on “Futuristic Assistive Technology” organized by Technology Information, Forecasting and Assessment Council, Department of Science and Technology, Government of India.

WORK EXPERIENCE

- Sep–Dec 2016 | **Project Engineer**, Mechanical Engineering, **IIT Kanpur**, India (3 months)
PI: Prof. Anupam Saxena
- 2014–16 | **Project Engineer**, Mechanical Engineering, **IIT Kanpur**, India (2 years 1 month)
Visiting Project Engineer, Intelligent Systems Research Center, **Ulster University**, UK
PI: Prof. Ashish Dutta (IIT Kanpur) and Prof. Girijesh Prasad (Ulster University)
- Designed non-metallic pneumatic actuator and developed 3D model, to power non-metallic hand exoskeleton for use in MEG environment.
 - Designed 3D model of hand exoskeleton and developed prototype for full extension of three fingers and grasping/ball-squeezing exercises for stroke patients.

TEACHING / WORKSHOPS

- 2018 | Delivered a workshop on how to write efficient and fast codes in MATLAB.
Association of Mechanical Engineers, IIT Kanpur.

M. TECH. THESIS

- Advisors | Prof. Ashish Dutta and Prof. Anupam Saxena, Mechanical Engineering, IIT Kanpur
- Title | Three Finger Hand Exoskeleton for translation and rotation of a slender object held in hand
- Abstract
- Captured human finger motion using setup of LED markers and single camera.
 - Synthesized serially concatenated four-bar linkages optimized to generate healthy human finger motion.
 - Developed 3D CAD model in Autodesk Inventor, and 3D printed prototype.
 - Performed open-loop control of prototype using Arduino and dc servomotors.

B. TECH. PROJECT

- Advisor | Former Prof. Asok Kumar Mallik, Mechanical Engineering, IIT Kanpur
- Title | Autonomous Floor Mopping Robot
- Abstract
- Designed 2D model in AutoCAD, and developed prototype.
 - Incorporated horizontally rotating disk with user-replaceable foam-pads for mopping, infra-red sensors for obstacle avoidance, and water-tank.
 - Designed PCB layout of electronic circuit in Protel DXP.

KEY ACADEMIC PROJECTS

- 2012 | Designed 3D model of **Autonomous Floor Mopping Robot**, version 2 and developed prototype incorporating ultrasonic sensor for obstacle avoidance, Brownian motion for floor coverage, water tank, and cleaning mechanism for cloth used for mopping.
- 2012 | Developed and trained **Artificial Neural Networks** for predicting
- Future images of image sequence from video footage.
 - Mileage per gallon of cars based on their specifications.

HONORS AND AWARDS

- 2017 | **Visvesvaraya Fellowship**, DEITY, Government of India (5 years)
- 2013 | **Academic Excellence Award** for year 2011-12 at IIT Kanpur
- 2011 | **Graduate Teaching Assistantship**, MHRD, Government of India (2 years)
- 2008 | **Proficiency Medal** for best B.Tech. project in Mechanical Engineering, IIT Kanpur
- 2008 | **TATA Consultancy Services Award** for best B.Tech. project in Mechanical Engineering, IIT Kanpur

TECHNICAL SKILLS

Programming	MATLAB, C, C++, Java, Bash
CAD	Autodesk Inventor, AutoCAD
Hardware	Arduino, ATmega, Proximity, Range and EMG Sensors, Servo and DC motor control