DR. BHIVRAJ SUTHAR

Assistant Professor, Next-Gen BIRD Lab, Indian Institute of Technology Jodhpur, Rajasthan, India
◇ School of Artificial Intelligence & Data Science ◇ Research Area: Bio-inspired Robotics & Artificial Intelligence
◇ 10 Years USA Business Visa and UAE Golden Visa Holder ◇ E-mail: bhivraj@iitj.ac.in ◇ Portfolio ◇ Google Scholar

PROFILE SUMMARY

1. **Ph.D. professional (Robotics)** with over 5 years of experience in **Academia and Industrial Research** in South Korea, UAE, and India.
2. **Research Interests** are in **Bio-inspired Robotics and Artificial Intelligence**, including Bio-inspired Mechanisms, Actuators, Grippers, Supernumerary Robotic Limbs, Exoskeleton, Sensors, Tactile Sensing, Vision-sensor, Metamorphic Drone Arms, Aerial Manipulation and Artificial Intelligence.
3. Taught UG and PG courses such as Introduction to Robotics, Telerobotics, Wearable Robotics, and Engineering Design at IIT Jodhpur, India.
4. Received very competitive and prestigious "Prime Minister Early Career Research Grant Award-2025"
5. Got opportunity to visit the Propulsion Laboratory (JPL), NASA, California, USA.
6. Achieved a track record of successfully designing and developing **over 15 robots in-house**.
7. Successfully published more than **33 Conference papers** (including 2-IROS and 2-ICRA), and **18 Journal articles** (16-Q1 and 2-Q2 Journals) and **7-Q1 Journal articles** are under review.
8. Successfully **1 patent is granted**, while **5 patents** are currently under review.
9. Received more than **10 Honors and Awards**, including finalist in **WearRAcon Innovation Challenge Award-2022** (USA), top 10 in **James Dyson Design Award-2021** (South Korea) and **Indian President Innovation Award-2015** (India).
10. Successfully secured **Research Funding** more than 2,00,00,000 INR.
11. Under his supervision, the IIT Jodhpur Robotics Team successfully cleared the first round of the **ISRO Moon Rover Robotics Challenge 2024**.
12. He is serving several academic positions at the IIT Jodhpur, such as **IITJ Senate Member, Chairman of PhD admission committee, PhD faculty advisor, Organizing Committee member of AIR 2025 International conference (Link), etc.**.
13. Serving as an **Editorial Board Member** for the Journal of Mechatronics and Robotics (JMR) and Science Publications and **Guest Editor** of "Bio-inspired mechanisms, actuators and grippers" for the Journal of Visualized Experiments.
14. Serve as a Reviewer of journals and conferences: Elsevier Mechatronics, IEEE Transaction of Mechatronics, IEEE Industrial Electronics, IEEE RAL, IEEE Access, IJRR, ICRA, IROS, ICCAS, ROMAN, CASE, UR, etc.
15. Invited as a **Guest Speaker** and delivered lectures on the topic of "**Wearable Robotics and the Future**" in several esteemed universities, leaving a lasting impact on the audience.

EDUCATION HISTORY

1. **Ph.D. (Wearable Robotics, Mechanical Engineering)** February 26, 2016 – August 28, 2020
   Korea University of Technology and Education, Republic of Korea CGPA: 4.01/4.5
   Research Fellow, IRIS Lab, *Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea*. Link, (QS Rank- 42)
   Thesis: *Design and Development of TSA Soft Actuator for Exosuit*
   Supervisor: *Professor Jee Hwan Ryu, IRIS Lab, KAIST, Republic of Korea*
   Courses: *Applied Robotics, Haptics and Telerobotics System, Advanced Signal Processing, Advanced Data Analysis, Modeling and Control, Non-linear Control System, Mechanical Behaviour of Materials and Microsystem Design.*

2. **M. Tech. (Cleaning Robotics, Center for Energy Studies)** July 03, 2012 – June 09, 2015
Indian Institute of Technology Delhi, India (48^{th} QS Rank in Engineering and Technology) CGPA: 7.15/10
Thesis: *Development of an Inchworm Mechanism for Solar Panel Cleaning Robot*
Supervisor: Professor Viresh Dutta (Supervisor, Center for Energy Studies) and Professor Sudipto Mukherjee (Co-Supervisor, Department of Mechanical Engineering)

3. **B. E. (Mechatronics, Electrical Engineering)** July 01, 2006 – June 30, 2010
College of Technology and Engineering (CTAE), Rajasthan, India Percentage: 71.90/100

RESEARCH CORE COMPETENCIES

Bio-inspired Mechanisms, Actuators, Grippers, Assistive Gloves, Supernumerary Robotic Limbs, Exoskeleton, Exo-suits, Tactile Sensing, Vision-based Sensing, Metamorphic Drone Arms, Aerial Manipulation and Artificial Intelligence.

EMPLOYMENT HISTORY AFTER PH.D. (5 YEARS)

1. **Assistant Professor** Indian Institute of Technology Jodhpur (IITJ), India
School of Artificial Intelligence and Data Science *October 25, 2023 - till now*
- Teaching and training on Tele-Robotics
- Development of a Novel Robotic Sixth Finger for Assisting Hemiplegic Patients in Bimanual Tasks

2. **Post-doctoral Researcher (2^{nd} Postdoc, 1 Year and 6 Months)** Khalifa University, United Arab Emirates (QS Rank-181)
Center for Autonomous Robotic System *December 08, 2021- October 20, 2023*
- Novel Robotic Finger using Twisted String Actuator with Modular Passive Return Rotational Joints to achieve high grasping force: Application to Wearable Sixth Finger
- Twisted string actuator (TSA)-based two fingers adaptive gripper for grasping random objects
- Design of Lightweight and Mechanically-Intelligent Supernumerary Robotic Limb based on Twisted String Actuators and Flexure Joints to Assist Hemiplegic Patients in Bimanual Tasks

3. **Post-doctoral Researcher (1^{st} Postdoc, 1 Year and 2 Months)** Chungnam National University, Republic of Korea
Department of Mechatronics Engineering *September 14, 2020- November 13, 2021*
- Design and development of a deployable and foldable aerial manipulator with a gripper for aerial manipulation
- Design of a supplementary robot arm for assistance in construction work
- Teach the subject "Introduction to Robotics and Mechatronics" to Bachelor and Master students

EMPLOYMENT HISTORY BEFORE PH.D. (2 YEARS AND 6 MONTHS)

1. **Junior Research Fellow** Indian Institute of Technology Delhi, India (48^{th} QS Rank in Engineering and Technology)
Industrial Research and Development Unit *August 17, 2015- February 24, 2016*
- Design and development of a wrist exoskeleton with force feedback for teleoperation of KUKA-KR5
- Kinematic and dynamics analysis of the exoskeleton robot

2. **Junior Research Fellow** Indian Institute of Technology Delhi, India
Industrial Research and Development Unit *August 16, 2011- August 16, 2012*
- Design and development of a 7 DOF exoskeleton robot
- Calibration of an exoskeleton for teleoperation of KUKA-KR 5 robot

3. **Project Associate** Indian Institute of Technology Delhi, India
Industrial Research and Development Unit *January 25, 2011- August 13, 2011*
- Prototype development and control of a bike simulator
- Testing and analysis of a bike simulator

4. **Project Associate** Indian Institute of Technology Delhi, India
Industrial Research and Development Unit *July 26, 2010- January 25, 2011*
- Installation of the micro turbine at site, development of electrical system and commissioning of the unit
- Electrical power distribution and data analysis

RESEARCH GRANT (APPROXIMATELY: 2,40,00,000 INR)

1. Design and Development of a Soft Exosuit for Upper Arm Rehabilitation with GUI Monitoring: Enhancing Hand, Wrist, and Elbow Mobility, **Prime Minister Early Career Research Grant Award**, India, **Role: Principal Investigator**, Amount: 45,50,000 INR (On going).
2. Next-Generation Prosthetic hand, **IHFC, IIT Delhi and DST**, India, **Role: Principal Investigator**, Amount: 1,32,00,000 INR (On going).
3. Next-Generation Mobility: Developing AI-powered Brain-Muscle-Controlled Lower Limb Exoskeleton with Wheelchair Integration, **Seed Grant, IIT Jodhpur**, India, **Role: Principal Investigator**, Amount: 25,00,000 INR (On going).
4. Affordable and Energy-Efficient EMG-Controlled 3-Finger Prosthetic Hand for Amputees, **Research grant by International NGO BMVSS (Link)**, India, **Role: Principal Investigator**, Amount: 8,50,000 INR (On going).
5. Spacecraft Docking Soft Impact Dynamics Modelling and Simulation Using Two Ground-Based Robotic Manipulators,**Role: Co-principal Investigator**, **Indian Space Research Organisation, India,** Amount: 28 Lakhs (On going).

PATENTS

1. *Bhivraj Suthar* "Reconfigurable water jet fire fighting drone", Indian Patent, Application number: 202311003108
2. *Bhivraj Suthar* "An actuator-driven bi-directional robotics finger for enhancing grasping force for end effectors and method thereof", Indian Patent, Application number: 202211057955 (Granted) and WIPO Patent, Application number: PCT/IB2022/061371
3. *Bhivraj Suthar*, Pallvi Gautam and Shubham Kumar, "Personalized smart bottle for optimal wellness and activity monitoring method", Indian patent, Application number: 202311047872
4. *Bhivraj Suthar*, Mohammad Zubair and Sachin Kansal, "5-DOF flexure mechanism base to suppress noise in the rotary sensor for a robotic system", Indian patent, Application number: 362283-001
5. *Bhivraj Suthar*, Balkishan Suthar and Ravi Ranjan Self-adjustable chassis of quadrotor unmanned aerial vehicle", Indian patent, Application number: 408/DEL/2015
6. Ravi Ranjan, *Bhivraj Suthar*, Venkat Chintala, "A system for NOx (Nitrogen Oxides) emission after treatment in automobiles," Indian patent, Application no- 333/DEL/2015

PEER-REVIEWED JOURNAL ARTICLES

1. Bhivraj Suthar, Mihai Dragusanu, Monica Malvezzi, "Twisted String Actuators: Comprehensive Review on Modeling, Design Innovations, Materials, Application Advances, and Future Challenges, **Measurements Elsevier) (Q1), (IF-5), 2025** (Accepted)
2. Mihai Dragusanu, Nicolas Guinet, Bhivraj Suthar,, Tommaso Lisini Baldi, Domenico Prattichizzo, Monica Malvezzi, "A 3-Degrees-of-Freedom Lightweight Flexible Twisted String Actuators (TSAs)-based Exoskeleton for Wrist Rehabilitation", **IEEE Robotics and Automation Letters (RA-L) (Q1), (IF-5), 2025** (Accepted)
3. Ankit Punia, Prabhat Sharma, Alok Jain, Ramnarayan R, Y. Kamala Raju, Nidhi Sharma, Bhivraj Suthar, Ramy Riad Hussein, Khristina Maksudovna Vafaeva, "Utilization of Fuzzy Logic (FL) and Whale Optimization Algorithm (WOA) for Optimization of Load Scheduling in Energy Management Systems", **International Journal of Information Technology, Springer Nature (Q1), (IF-4.8), 2025** (Accepted)
4. Praveen Kumar Muthusamy, Mohammed Basheer Mohiuddin, Anees Peringal, Bhivraj Suthar, Lakmal Seneviratne, Yahya Zweiri, "Aerial manipulation of long objects using adaptive neuro-fuzzy controller under battery variability", **Nature- Science Reports (Q1), (IF-3.8), 2025** Link
5. Bhivraj Suthar, Mohammad Zubair and Seul Jung, "Self-folding Gravity Compensation Mechanism for a Supplementary Folding Robot Arm: Design, Analysis and Implementation" in **Robotics and Autonomous Systems, Elsevier (Q1)**, **(IF-5.3)**, 2024
6. Lochan Kshetrimayum, Asim Khan, Bhivraj Suthar, Lakmal Seneviratne and Irfan Hussain, "Advancements in Precision Spraying of Agricultural Robots: A Comprehensive Review" in **IEEE Access Journal, (IF- 3.4**), 2023 Link, DOI: 10.1109/ACCESS.2024.3450904

7. Bhivraj Suthar, Yusra Abdulrahman and Yahya Zweiri, "Robotic Fingers: Advancements, Challenges, and Future Directions–A Comprehensive Review" in **IEEE Access Journal, (IF- 3.4**), 2024 Link, DOI: 10.1109/ACCESS.2024.3440007

8. Bhivraj Suthar, Basma Hasanen, Lakmal Seneviratnea, Yahya Zweiria and Irfan Hussain, "Design of Twisted String Actuated Flexure Joint for Supernumerary Robotic Arm for Bi-manual Tasks" in **IEEE Sensors Journal (IF-4.32)**, 2024 Link, DOI: 10.1109/JSEN.2024.3422791

9. Bhivraj Suthar, Mohammad Ismail Awada, Lakmal Seneviratnea, Yahya Zweiria and Irfan Hussain, "Novel Robotic Finger Using Twisted String Actuator with Modular Passive Return Rotational Joints to Achieve High Grasping Force: Application to Wearable Sixth Finger" in **Journal of Mechatronics, Elsevier (Q1)**, **(IF-5.3)**, 2023Link, DOI: 10.1016/j.mechatronics.2024.103157

10. M. Dragusanu, D. Troisi, B. Suthar, I. Hussain, D. Prattichizzo and M. Malvezz, "MGlove-TS: a Modular Soft Glove based on Twisted String Actuators and Flexible Structures" in **Journal of Mechatronics, Elsevier (Q1)**, **(IF-5.3)**, 2024 Link, DOI: 10.1016/j.mechatronics.2024.103141

11. Bhivraj Suthar and Jee-Hwan Ryu, "A Soft Twisted String Actuation System for Exosuit: Undesirable Behaviors and the Effect of Pre-twists" in **Journal of Mechatronics, Elsevier (Q1)**, **(IF-5.3)**, 2023Link, DOI: 10.1016/j.mechatronics.2023.103084

12. Praveen Kumar Muthusamy, Bhivraj Suthar, Matthew Garratt, Hemanshu Pota, Lakmal Seneviratne and Yahya Zweiri,"Self-organising BFBEL control system for a UAV under wind disturbance" in **IEEE Transactions on Industrial Electronics**, **(IF-8.23)**, June 2023 Link, DOI: 10.1109/JSEN.2023.3270172

13. Bhivraj Suthar, Mohd.Zubair, Sachin Kansal and Sudipto Mukherjee, "Design of Adaptive Sensor Coupling-based Upper Limb 7-DOF Exoskeleton for Smooth Human Motion Tracking: ASC-EXO" in **IEEE Sensors Journal (Q1)**, **IF-4.32**, April 2023, Link, DOI: 10.1109/JSEN.2023.3270172

14. Omar Faris, Huda Alyammahi, Bhivraj Suthar, Rajkumar Muthusamy, Umer Hameed Shah, Irfan Hussain, Dongming Ganb, Lakmal Seneviratne and Yahya Zweiri,"Design and Experimental Evaluation of a Sensorized Parallel Gripper based on the Periscope Principle" in **Journal of Mechatronics, Elsevier (Q1)**, **IF-3.65**, April, 2023, Link, DOI: DOI: 10.1016/j.mechatronics.2023.102955

15. Mohammad Zubair, Bhivraj Suthar and Seul Jung, "Design and Analysis of Flexure Mechanisms for Human Hand Tremor Compensation", **IEEE Access (Q1), IF- 3.367**, vol. 10, pp 36006 - 36017, March 2022. Link, DOI: 10.1109/ACCESS.2022.3162903

16. Sachin Kansal , Mohd.Zubair, Bhivraj Suthar, and Sudipto Mukherjee, "Tele-operation of an Industrial Robot by an Arm Exoskeleton for Peg-in-Hole Operation Using Immersive Environments", **Robotica (Q1), IF- 2.40**, pp- 1 - 16, May 2021. Link, DOI: 10.1017/S0263574721000485

17. Bhivraj Suthar and Seul Jung, "Design and Feasibility Analysis of a Foldable Robot Arm for Drones Using a Twisted String Actuator: FRAD", **IEEE Robotics and Automation Letters (Q1), IF- 4.32**, pp- 5769 - 5775, June 2021. Link, DOI: 10.1115/1.4050813

18. Bhivraj Suthar and Seul Jung, "Design and Bending Analysis of a Metamorphic Parallel Twisted-Scissor Mechanism," **Transactions of the ASME-Journal of Mechanisms and Robotics (Q1), IF- 2.57**, pp- 1-11, April 2021. Link, DOI: 10.1109/LRA.2021.3084890

19. Rahul Shrivastava, Prabhat Kumar, Sudhakar Tripathi, Vivek Tiwari, Dharmendra Singh Rajput, Gadekallu Thippa Reddy, Bhivraj Suthar, Saurabh Singh and In-Ho Ra, "A Novel Grid and Place Neuron's Computational Modeling to Learn Spatial Semantics of an Environment", **Applied Sciences, MDPI (Q2), IF- 3.8**,pp-3735 - 3741, September 2019. Link, DOI: 10.3390/app10155147

20. Muhammad Arshad Khan, Bhivraj Suthar, Igor Gaponov and Jee-Hwan Ryu "Single-Motor-Based Bidirectional Twisted String Actuation With Variable Radius Pulleys," **IEEE Robotics and Automation Letters (Q1), IF- 3.8**,pp-3735 - 3741, September 2019. Link, DOI: 10.1109/LRA.2019.2928772

21. Rajkumar Gupta, Mangal Sharma, Davinder Pal Singh, Bhivraj Suthar, Subir Kumar Saha , "Further Improvements to the Device by IIT Delhi for the Manufacturing of Beads from Holy Basil (Tulasi)," **International Journal of Current Science (Q2), IF- 1.17**, vol. 109, pp. 1660-1664, Nov 2015. Link, DOI: 10.18520/v109/i9/1660-1664

JOURNAL AND CONFERENCE ARTICLES (UNDER REVIEW)

1. Nayan M Kakoty, Suthar B., "Development of A Bioinspired Prosthetic Hand: i-Sense," Advances In Robotics 2025 (**AIR 2025**), July 02 - 05, 2025, IIT Jodhpur, India.
2. Nayan M Kakoty, Suthar B., "Hand Function Recovery in Chronic Stroke Patients using Dynamic Constraints based ExoRehabGlove," Advances In Robotics 2025 (**AIR 2025**), July 02 - 05, 2025, IIT Jodhpur, India.
3. Nishant, Suril S., Suthar B., "Implementation and Validation of Task-Based Control for Bi-Manual Manipulation Using TurtleBot Manipulators," Advances In Robotics 2025 (**AIR 2025**), July 02 - 05, 2025, IIT Jodhpur, India.
4. Vishal R. Suthar B., "Kinematic and Dynamic Modeling-Based Design Tool for Twisted String Actuators," Advances In Robotics 2025 (**AIR 2025**), July 02 - 05, 2025, IIT Jodhpur, India.
5. CHUNGHYEON Lee, Junho Choi, Eungyu Choi, Eungyu Choi, Bhivraj Suthar and Seokhwan Jeong, "Twisted String Actuation Module for Compact Robotic Finger with Extended Stroke, Linearity, and Bidirectional Operation", **IEEE Robotics and Automation Letters (Q1), IF- 4.32**, 2024. (Under review)
6. Mihai Dragusanu, Nicolas Guinet, Bhivraj Suthar, Tommaso Lisini Baldi, Domenico Prattichizzo and Monica Malvezzi, "A 3-Degrees-of-Freedom Lightweight Soft Twisted String Actuators (TSAs)-based Exoskeleton for Wrist Rehabilitation" in **IEEE Transaction of Mechatronics, (Q1)**, **IF-5.7**, 2024. (Under review)
7. Bharat Singh, Rajesh Kumar, B. Suthar and Mohit Makkar, "Direction Estimation Model via Ensemble AI Networks for Inertial Measurement Units" in **IEEE Sensors Letters (IF-5.30)**, 2024. (Accepted)
8. Mihai Dragusanu, Bhivraj Suthar and Monica Malvezzi, "Twisted String Actuators: Comprehensive Review on Modeling, Design Innovations, Application Advances, and Future Challenges" in **Journal of Mechatronics, Elsevier (Q1)**, **IF-5.3**, 2024. (Under review)
9. Yusra Abdulrahmana, Laith AbuAssia, Abdulla Ayyada, Mohammed Ramadana, Mohamad Halwania, John Fergusonc, Abdelqader Abusafiehc, Bhivraj Suthar and Yahya Zweiria, "Enhancing Cobot Capability: Multi-Functional End-Effector for Drilling, Deburring, and Painting Tasks", **IEEE Robotics and Automation Letters (Q1), IF- 4.32**, 2024. (Under review)
10. Mohammad I. Awad, Nour Al-Rahmani, Zhenwei Nui, Bhivraj Suthar, Irfan Hussain, M. Fatima Domingues and Kinda Khalaf, "Compliant Robotic Biceps Machine for Resistance Training and Upper Limb Rehabilitation, " **IEEE Access (Q1), IF- 4.32**, 2024. (Under review)
11. Asim Khan, Kshetrimayum Lochan, Islam Elsayed; B. Suthar, Seneviratne Mudigansalage, Irfan Hussain, "Advancements in Precision Delivery of Agricultural Robotics: A Comprehensive Review" in **Journal of Computers and Electronics in Agriculture (IF-6.75)**, 2024. (Under review)

CONFERENCE/WORKSHOP PUBLICATIONS

1. Mihai Dragusanu, Danilo Troisi, Bhivraj Suthar, Domenico Prattichizzo, Monica Malvezzi, "Development of a soft actuated glove based on twisted string actuators for hand rehabilitation" in **IEEE EMB's 10th International Conference on Biomedical Robotics and Biomechatronics (BioRob 2024)**, 1-4 September 2024 Heidelberg, Germany. (accepted)
2. Bhivraj Suthar, Mohammad Zubair, Sachin Kansal and Sudipto Mukherjee, "Development of a Compliant Joint Based Upper Limb Exoskeleton for Stable Tele-manipulation: CJ EXO," *IEEE RAS/EMBS International Conference on Biomedical Robotics and Biomechatronics* ***(BioRob 2022)***, August 21-24, 2022, Seoul National University, Seoul, Republic of Korea Link
3. Bhivraj Suthar and Seul Jung, "Conceptual Design of an Extendable Rope-inspired Module Space Orbit Arm for Maneuvering: ERM- SOA," 46^{th} ***NASA Aerospace Mechanisms Symposium-2022***, May 11-13, 2022, NASA Johnson Space Center and Lockheed Martin Space, USA
4. Bhivraj Suthar and Seul Jung, "Design and Feasibility Analysis of a Foldable Robot Arm for Drones Using a Twisted String Actuator: FRAD", *IEEE International Conference on Intelligent Robots and Systems* **(IROS 2021)**, Prague, Czech Republic.Link
5. Bhivraj Suthar and Seul Jung, "Design of a Drone-Hawk Gripper for Nest Removal from Electric Tower", 21^{st} *International Conference on Control, Automation and Systems* **(ICCAS 2021)**, October 12-15, 2021, Jeju, Republic of Korea.Link
6. Bhivraj Suthar, YeJin Chio and Seul Jung, "Design and Experimental Evaluation of Foldable Robot Arms for a Holding and Installation Work: FRAHI", 30^{th} *IEEE International Conference on Robot and Human Interactive Communication* **(ROMAN 2021)**, August 8 - 12, 2021, Canada. Link

7. Bhivraj Suthar and Seul Jung, "Conceptual design and Feasibility Analysis of Foldable Robotic Arms for Collaborative Work: FRAC", 17^{th} *IEEE International Conference on Automation Science and Engineering* **(CASE 2021)**, Lyon, France. Link

8. Bhivraj Suthar and Seul Jung, "Design of a Novel Twisted-Scissor Structure for Foldable Robot Arm", 18^{th} *International Conference on Ubiquitous Robots* **(UR 2021)**, Gangwon-do, Republic of Korea .PDF

9. Mohd. Zubar, Yejin Choi, Bhivraj Suthar and Seul Jung, "Vibration Suppression Mechanism for Foldable Robot Arm for Drones", 18^{th} *International Conference on Ubiquitous Robots* **(UR 2021)**, Gangwon-do, Republic of Korea.PDF

10. Bhivraj Suthar and Seul Jung, "Foldable Supplementary Robot Arm Exosuit for Collaborative Work: FSRA-Exosuit", **IROS Workshop on Challenges and Opportunities of Human-robot Symbiosis-2021**, October 1, 2021, Singapore. LINK

11. Bhivraj Suthar and Seul Jung, "Design and Development of a Co-axial Passive Flexion Mechanism-based Gripper for Irregular Objects", 21^{st} *International Conference on Control, Automation and Systems* **(ICCAS 2021)**, October 12-15, 2021, Jeju, Republic of Korea.PDF

12. Bhivraj Suthar and Seul Jung, "Design of Gravity Compensation Mechanism for a Supplementary Foldable-Robotic Arm for Construction Workers", 21^{st} *International Conference on Control, Automation and Systems* **(ICCAS 2021)**, October 12-15, 2021, Jeju, Republic of Korea.

13. Mohammad Zubair, Bhivraj Suthar and Seul Jung, "An Experimental Setup to Study the Performance of Flexure Mechanism", 21^{st} *International Conference on Control, Automation and Systems* **(ICCAS 2021)**, October 12-15, 2021, Jeju, Republic of Korea.Link

14. Bhivraj Suthar and Seul Jung, "Foldable Supplementary Robot Arm Exosuit for Collaborative Work: FSRA-Exosuit", **IROS 2021 Workshop Challenges and Opportunities of Human-robot Symbiosis: from Wearable Robots to Neurorobotics**, October 1, 2021, Singapore.Link

15. Bhivraj Suthar and Vikramaditya Dave, "Bio-inspired Cat-Leap Parkour Rolling Mechanism (CPRM): Design Inception to Realization, and Applications",**IROS Workshop on Mechanisms and Design from Inception to Realization-2020**, October 29, 2020, Las Vegas, U.S.A. Link

16. Muhammad Arshad Khan, Bhivraj Suthar, Igor Gaponov and Jee-Hwan Ryu, "Single Motor-based Bidirectional Twisted String Actuation with Variable Radius Pulleys", in *IEEE International Conference on Robotics and Automation* (**ICRA 2019**), November 4 – 8, 2019, Macau, China Link

17. Bhivraj Suthar, and Jee-Hwan Ryu, "A Study on Guided Twisted String Actuation Systems: Mathematical Model and Experimental Evaluation," *International Workshop on Active Materials and Soft Mechatronics* (**AMSM 2019**), October 16-19, 2019 at Incheon, Republic of Korea. Link

18. Hyesonseok Seong, Muhammad Arshad Khan, and Bhivraj Suthar, Igor Gaponov, Jee-Hwan Ryu, "Twisted Strings based Hip Joint Exoskeleton," in *International Workshop on Active Materials and Soft Mechatronics* (**AMSM 2019**), October 16-19, 2019, Republic of Korea Link

19. Muhammad Arshad Khan, Bhivraj Suthar, Igor Gaponov, Jee-Hwan Ryu, "Design of Variable Radius Pulley for Linearized Input-Output Transmission Characteristics of Twisted String Actuator," in *International Workshop on Active Materials and Soft Mechatronics* (**AMSM 2019**), October 16-19, 2019 at Incheon, Republic of Korea Link

20. Bhivraj Suthar, Muhammad Usman, Hyunseok Seong, Igor Gaponov, and Jee-Hwan Ryu, "Preliminary Study of Twisted String Actuation Through a Conduit Toward Soft and Wearable Actuation, " *IEEE International Conference on Robotics and Automation*" (**ICRA 2018**), May 21-25, 2018, Brisbane, Australia. Link

21. Bhivraj Suthar, Igor Gaponov and Jee-Hwan Ryu, "Soft Twisted String Actuator Module for Wearable Robotic Applications," *International workshop on Active Materials and Soft Mechatronics* (**AMSM2018**), October 2018 at KAIST, Republic of Korea. Link

22. Harsimran Singh, Bhivraj Suthar, Syed Zain Mehdi, and Jee-Hwan Ryu "Ferro-Fluid Based Portable Finger-tip Haptic Display and Preliminary Experimental Evaluation" in **IEEE Haptics Symposium 2018**, March 25-28, 2018, San Francisco California, USA. Link

23. Muhammad Usman, Bhivraj Suthar, Hyunseok Seong, Igor Gaponov, and Jee-Hwan Ryu "A Study on Life Cycle of Twisted String Actuators: Preliminary Results, " *IEEE International Conference on International Conference on Intelligent Robots and Systems* (**IROS 2017**)," September 2017, Vancouver Convention Centre, Canada. Link

24. Muhammad Usman, Bhivraj Suthar, Hyunseok Seong, Elliot Hawkes, Igor Gaponov, and Jee-Hwan Ryu "Twisted String-based Module with Passive Return Mechanism, " *IEEE International Conference on Robotics and Automation*(**ICRA 2017**)" May 29 to June 3, 2017, Sands Expo and Convention Centre, Singapore. Link

25. Mohd. Zubair, Sachin Kansal, Bhivraj Suthar, Sudipto Mukherjee "Kinematic Mapping of Exoskeleton with Virtual KUKA Robot" in *IEEE International Conference on Robotics and Automation for Humanitarian Applications* (**RAHA 2016**)" December 18-20th 2016, Amrita University, Kerala, India. Link

26. Shakshi Rawal, Sachin Kansal, Mohd. Zubair, Bhivraj Suthar, Sudipto Mukherjee, "Jittering removal in KUKA KR5 using modified Kalman filter while teleoperation with the exoskeleton," 8th Asian Conference on Multibody Dynamics, **ACMD 2016**, August 7 - 10, 2016, Kanazawa, Japan. Link

27. Sachin Kansal, Mohd. Zubair, Nishant Bugalia, Bhivraj Suthar, Mohd. Zubair and Sudipto Mukherjee, "Tele-Operation of KUKA KR5 by an Arm Exoskeleton through Immersive Environment for Peg-In-Hole Operation," 8th Asian Conference on Multibody Dynamics, **ACMD 2016**, August 7 - 10, 2016, Kanazawa, Japan. Link

28. Lamyanba Heisnam and Bhivraj Suthar, "20 DOF robotic hand for tele-operation: Design, simulation, control and accuracy test with leap motion," *IEEE International Conference on Robotics and Automation for Humanitarian Applications* (**RAHA 2016**)" December 18-20th 2016, Amrita University, Kerala, India. Link

29. Zubair M., Suthar B., Priyansh Z., Jaitly S., Mukherjee S. "Implementation of I2C communication Protocol in Exoskeleton for tele-operation of Industrial Robot " International Conference on Multibody System Dynamics-2016, **ICMSD 2016**, May 28 – June 01, 2016, McGill University, Canada.

30. Suthar B., Mukherjee S., Zubair M., Jaitly D., Kanal S., "Removal of Jittering in KUKA KR5 while tele-operation with Exoskeleton," Advances In Robotics 2015 (**AIR 2015**), July 02 - 05, 2015, BIT Goa, India. Link

31. Suthar B., Mukherjee S., Zubair M., Jaitly D., Kanal S., "Removal of Jittering in KUKA KR5 while tele-operation with Exoskeleton," Advances In Robotics 2015 (**AIR2015**), July 02 - 05, 2015, BIT Goa, India. Link

32. Suthar B., Mukherjee S., Dutta V. "Inch-worm mechanism for solar panel cleaning robot"at 2nd International and 17th National Conference on Machines and Mechanisms, (**iNaCoMM2015**), Dec. 16-19, 2015, IIT Kanpur, India. PDF

33. Zubair M., Suthar B., Kansal S., Mukherjee S., "Haptic Exoskeleton for Industrial Robot" The Joint International Conference on Multibody System Dynamics (**IMSD 2014**) and the 7th Asian Conference on Multibody Dynamics (**ACMD 2014**) will be held on June 30 – July 3, 2014 at the Busan Exhibition and Convention Center (BEXCO) in Busan, Republic of Korea. PDF

BOOK CHAPTER

1. Sujit Kumar, M. Balamurugan, Vikramaditya Dave and Bhivraj Suthar, "Useful techniques and applications of computational intelligence", 2022 Walter de Gruyter GmbH, Berlin/Boston Link

HONORS AND AWARDS

1. **Member of Technical Session Chair** in Advances in Robotics (AIR) is a series of biennial international conferences organized by The Robotics Society (AIR- 2024) at the IDRD: Robotics and Mobility Systems, IIT Jodhpur during 2-5 July, 2024.

2. **Member of Technical Program Committee** in the 4th International Conference on Emerging Frontiers in Electrical and Electronic Technologies (ICEFEET- 2024) at the Department of Electrical Engineering, National Institute of Technology Patna during 21-23, November 2024.

3. **Delegate** in the Workshop "Emerging Technologies and Challenges for Exoskeleton", DEBEL (DRDO) laboratory, Bengaluru, date: 16-17 April 2024.

4. **Faculty advisor** of the "IIT Jodhpur Robotics team" for ISRO Robotic Challenge- URSC and our team successfully cleared the first round of the competition.

5. **WearRAcon Innovation Challenge Award-2022, USA**: "Head Motion Controlled Foldable Supplementary Robot Arm Exosuit for Construction Work: FSRA-Exosuit" was selected in the finalist of the WearRAcon Innovation Challenge Award-2022, USA.Link

6. **James Dyson Design Award-2021, Korea**: "Twisted Scissor Mechanism-based Foldable Aerial Manipulator" was selected as one of the top ten projects nationwide in the James Dyson Design Award-2021, Republic of Korea.
7. **Creativity and Innovation Award-2021, Korea**: "Bird's Nest removal Technology from Electric Poles Using Drone's Folding Robot Arm" by the Korean Electrical Society, Creativity and Innovation Award-2021, Republic of Korea, July 15, 2021.
8. **Samsung Electro-Mechanics Award-2021, Korea** : "Foldable Drone Arm for stable Dust cleaning performance" by the Korean Society of Electronic Engineering, Samsung Electro-Mechanics Award-2021, Republic of Korea, July 01, 2021.
9. **Asia Haptics Demo Finalist-2018, USA**: "A Novel FerroFluid-based Fingertip Tactile Display for Concurrently Displaying Texture and Geometric Perception" is in the finalist for a Demo in Asia Haptics-2018, San Francisco, USA. Link
10. **Gandhian Young Technological Innovation Award- 2015, India**: Received award by the PRESIDENT OF INDIA for the innovation idea "Inchworm Mechanism for solar panel cleaning robot" in March 2015, New Delhi, India.
11. **IIT Delhi Class of 89 Innovation Award-2015, India**: Got the Runner-up award of IIT Delhi Class of 89 Innovation Award 2015, New Delhi, India.
12. **Young Professional Engineering Award-2015, India**: Got Young Professional Engineering Award-2015 from the Maharana Pratap University of Agriculture and Technology, Udaipur, Rajasthan, India, 2015.
13. ***Best Presentation Award-2015, India*:** Received the Best Presentation Award in the "National Conference on Solar Robotics", Jamia Milia Islamia, New Delhi, India, August 2015.
14. ***Junior Research Fellowship-2011, India*:** Recipient of a Junior Research Fellowship from the Industrial Research and Development Unit, Indian Institute of Technology Delhi, India, August 2011.
15. **Judge Committee Member:** Invited as a Judge in Robotics competition "ROBOTRONICS-2015" at Amity International School, Gurgaon, Delhi- NCR India. PDF

DELIVERED TALKS

1. **Invited Speaker:** Invited for a talk on 12 April 2024, titled "Wearable Robotics for Construction Industry" at the Peter the Great St Petersburg Polytechnic University, Russia.
2. **Post-Doctoral Session-Beyond PhD:** "Foldable Robot Arm for Drones: Applications and Challenges", in 21 International Conference on Control, Automation and Systems, October 12-15, 2021, Jeju, Republic of Korea.
3. **Short talk in IROS Workshop 2021:** "Foldable Supplementary Robot Arm Exosuit for Collaborative Work: FSRA-Exosuit", IROS Workshop 2021 on Challenges and Opportunities of Human-robot Symbiosis: from Wearable Robots to Neurorobotics, October 1, 2021, Singapore.
4. **Guest Speaker:** Invited for a talk on "Robots: Past, Present and Future" in the KR Mangalam University, (June 2021), Gurugram, India.
5. **Short talk in IROS Workshop 2020:** "Bio-inspired Cat-Leap Parkour Rolling Mechanism (CPRM): Design Inception to Realization and Applications", IROS Workshop 2020 on Mechanisms and Design from Inception to Realization, October 29, 2020, Las Vegas, U.S.A.
6. **Guest Speaker:** Invited for a talk online on "Application of different Tools and Techniques for Academic and Research Writing and Reporting" Faculty Development Program at the RR Institute of Modern Technology (May 2020), Lucknow, India.
7. **Keynote Speaker:** Invited for a talk on "Wearable Robotics: Exoskeleton and Exosuit" in the CTAE college, SS Engineering College and Techno NGR College, (January 2020), Udaipur, Rajasthan, India.
8. **Guest speaker :** Invited for a talk on "Robotics, Future and Emerging Technologies" in the College of Technology and Engineering (January 2019), Udaipur, Rajasthan, India.

TECHNICAL COURSES AND TRAININGS

1. **Johnson Space Center, NASA, USA**: Technical course on "Fundamentals of Space Vehicle Mechanisms", May 2022, Johnson Space Center, NASA, USA.

2. **Maritime Robotic Pool Training, UAE**: Training on "Maritime Robotic Pool Training for Testing of Underwater Robots", March 2022, Khalifa University, Abu Dhabi, UAE
3. **Jet Propulsion Laboratory, NASA, USA**: Technical course and training on "Dynamics and Real-Time Simulation for Spacecraft", August 2019, Jet Propulsion Laboratory-NASA, Pasadena, California, USA.
4. **KUKA Robotics Germany**: Training on "Basic programming and advanced programming of KUKA Robot", 2012, Indian Institute of Technology Delhi, India.
5. **Tele-manipulation, BARC, India**: Training on "Master/Slave manipulator", 2012, Bhabha Atomic Research Centre **(BARC)**, Mumbai, India

MEMBERSHIP IN PROFESSIONAL ASSOCIATIONS

1. American Society of Mechanical Engineers membership (Membership number: ASME-2099332)
2. Wearable Robotics society membership (Membership number: 45761565)
3. IEEE Young Professional membership (Membership number: 93579146)
4. Robotic Society of India membership (Membership number: S150394)

REVIEWER FOR JOURNALS AND CONFERENCES

1. IEEE Robotics and Automation Letters; Publisher- IEEE Robotics and Automation Society (RAS)
2. IEEE International Conference on Robotics and Automation (ICRA); Organizer- IEEE Robotics and Automation Society (RAS)
3. IEEE/RSJ International Conference on Intelligent Robots and Systems(IROS); Organizer- IEEE Robotics and Automation Society (RAS)
4. Mechanism and Machine Theory; Publisher- Elsevier
5. Computer and Electrical Engineering; Publisher- Elsevier
6. International Conference on Control, Automation and Systems (ICCAS); Organizer- Institute of Control, Robotics, and Systems (ICROS), Republic of Korea
7. IEEE/ASME Transactions on Mechatronics; Organizer- IEEE Robotics and Automation Society (RAS)

IN HOUSE DEVELOPED ROBOTS/MECHATRONIC SYSTEMS

1. **Bio-inspired Mechanisms (TRL 4):** Spider-inspired Pipe Inspection Robot (Video); Bio-inspired Cat-Leap Parkour Rolling Mechanism (Video)
2. **Grippers (TRL 4):** Flexure Joint-based Two-fingers Gripper (Video); Multi-fingers Delta Gripper (Video)
3. **Supernumerary Robotic Limbs (TRL 4):** Sixth Robotic Finger (Video); Third Robotic Arm (Video); Foldable Supernumerary Robotic Arms (Video)
4. **Brain Computer Interface for Wearable Robotics (TRL 2):** Brain Computer Interface for Sixth Robotic Finger (Video);
5. **Soft Sensing and Exoskeleton (TRL 4):** Adaptive Sensor Coupling-based 7-DOF Exoskeleton (Video); Design Evolution of Exoskeleton (Video)
6. **Soft Actuators and Exosuit (TRL 4):** Wearable Actuator and Elbow Exosuit (Video); Full Arm Exosuit (Video); MGlove-TS (Video)
7. **Vision-based Sensing (TRL 4):** Sensorized Parallel Gripper (Video)
8. **Tactile/Haptics Device (TRL 3):** Fingertip Haptic Display (Video)
9. **Robot Control (TRL 3):** Bike Simulator (Video; Drone control (Video; Elbow Exosuit (Video)
10. **Metamorphic Arm and Aerial Manipulation (TRL 5):** Parcel delivery using extendable drone arm (Video); Aerial manipulation using a two-finger gripper (Video); Bird nest removing from HT line using a drone with an extendable robot arm (Video)