RADAN PATHAN

To learn and serve in a professionally challenging environment in a manner that positively benefits the research's objectives and enhances my skills in the field of Control, Automation and Robotics.

Education

PhD Candidate in BioRobotics   October 2021 **– Present**

The [BioRobotics](#) Institute ([SMB Lab](#)), Scuola Superiore Sant'Anna, Pisa, Italy

Thesis title: "Embodied Intelligence Concepts for Sensing in Soft Structure"

Master of Science (Control Science & Engineering)   September 2016 **–** March 2019

Shanghai Jiao tong University, Shanghai, China ([webpage SJTU](#))

*CGPA **3.81** out of 4.0*, among top **5%** students.

Electronics Engineering, Bachelor of Science   January 2011 – Dec 2014

ISRA UNIVERSITY, Hyderabad, Pakistan (www.isra.edu.pk)
Obtained Percentage **82.36%** (***Silver Medalist***)
*CGPA **3.69** out of 4.0*

Master Thesis

- **Design, Fabrication, Modeling and Control of Soft Robotic Finger combined with smart material for dexterous grasping.**
  Comprehensively describe the design, fabrication and control of a modular soft robotic finger used for dexterous grasping tasks. In addition, study of a smart material (shape memory polymer) has been conducted and successfully integrated with a soft robotic finger/actuator to further enhance their existing capabilities and provide them with variable stiffness functionalities.
  Keywords: Soft Robotic Gripper, Shape Memory Polymer, Finite Element Analysis, Variable Stiffness, Smart materials.

Research Experience

Student Research Assistant (SJTU)   January 2018 **–** March 2019
- Worked as a student research assistant in Intelligent Robotics and Machine Vision Lab at Shanghai Jiao Tong University. My research activities area mainly related to soft robot design and control, soft grippers design and manufacturing, soft sensors and their integration within soft actuators, and studies related to Smart Materials (SMP) and their applications in soft robotics.

RESEARCH INTEREST

-Soft Robotics
-Smart Materials
-Medical Robots
-Soft Grippers
-Wearable Robots
-FEAs Modeling
-Soft Tactile Sensors

SOFT SKILLS

-C/C++
-Python
-Linux (ROS)
-LADDER LOGIC (PLC)
-MATLAB
-MULTISIM
-Processing
-PROTEUS
-ARDUINO
-LAB VIEW
-MS OFFICE
-DS Solid Works
-SIMULIA ABAQUS
-HMI Designing
-ST-Logic (PLC)

HARDWARE SKILLS

-Circuit Designing
-PCB Designing
-Sensors Integration
-Motors Controlling
-Relay Logic

Industrial Experience

Project Engineer-Automation   April 2019 – July 2020
    Shanghai Empower Technologies Co. Ltd, (Empower.cn)

- Responsible for HMI designing and programming of the PLC controller.
- Drafting & writing technical manuals of the projects.
- Performing precision laser cutting and welding tasks using commercial robotic manipulators
- Providing overseas technical support and training.

> **PROJECTS**

- **Smart Handheld Laser Welding Control System**.   April 2019 –Oct 2019
  * Sole HMI designer and programmer of the project.
  * Project has been commercially using by our various customers throughout China.

EMBEDDED SKILLS

-ARM-Cortex
-MCU
-STM32
-AVR
-SPI
-I2C
-Raspberry-Pie
-Intel Galileo
-IoT
-Blue Pill STM32
-Modbus com
-Particle

Research Projects

- Design & fabrication of a soft robotic gripper used for dexterous grasping task.
- Hyper-elastic materials characterization, modeling and their effects on soft actuator
- Variable stiffness concepts in a soft system using smart materials
- Design and characterization of a flexible fabric sensor for force & curvature sensing
- Closed loop control of a soft gripper using embedded flex sensors
- Design and characterization of a flexible soft heater for joule heating purpose.

Publications

- Rehman, H.U., Y. Chen, M.S. Hedenqvist, **R. Pathan**, H. Liu, H. Wang, T. Chen, X. Zhang, and H. Li. "High-Cycle-Life and High-Loading Copolymer Network with Potential Application as a Soft Actuator." Materials and Design vol. 182 (2019), doi: 10.1016/j.matdes.2019.108010.
- **R. Pathan**, H. Wang, H. U. Rehman, J. M. Butt, and Y. Chen, "Design of Carbon Fiber Based Flexible Soft Heater for SMP Embedded Soft Actuators: A Step towards Artificial Joints," 2018, doi: 10.1109/ROBIO.2018.8664722.
- J. M. Butt, H. Wang, and **R. Pathan**, "Design, Fabrication, and Analysis of a Sensorized Soft Robotic Gripper," 2019, doi: 10.1109/CYBER.2018.8688201

Academic Projects

- "RGB color detection and pronouncing robot", final year project of bachelors
- "GSM based home automation & acknowledgment", student project
- "Object weight detection & sorting via robotic arm", student project
- "PID algorithm based autonomous line following robot", student project
- "5-DOF teleoperated robotic arm design & control via GUI", student project

Honors & Achievements

- Awarded with SJTU International Student Scholarship throughout master's degree.
- Honored with a **Silver Medal** for maintaining a higher level of performance throughout bachelor studies.
- Certificate of Achievement in Line Follower Robot Competition (I cube 2014).
- Certificate of Achievement in Hardware Design Competition (I cube 2014).
- Certificate of Achievement in final year Project Competition (ISRA University 2014).

Other Certificates

- Certificate of Diploma in Computer & Business Skills (DCBS)
- Certificate of Short Corse in 8-bit AVR Microcontroller.
- Certificate of Short Corse in LAB View.
- IEEE student member.

Extracurricular Activities

- Former member of ISRA University Youth Development forum.
- Equally participated in international events at Shanghai Jiao Tong University such as Gala-night, international culture exhibition and Jiaode-Renji Day.
- Participated in Dragon boat competition at Shanghai Jiao Tong University.
- Participated in cricket and Football tournaments at ISRA University.