Muhammad Arshad Khan

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Education

- **Korea University of Technology and Education** — Cheonan, South Korea
  Master of Engineering in Mechanical; GPA: 4.32 (4.32/4.5) — *Sept. 2017 – June, 2019*
- **NED University of Engineering and Technology** — Karachi, Pakistan
  Bachelor of Engineering in Biomedical; GPA: 3.58 (3.58/4.0) — *Jan. 2012 – Dec. 2015*

Experience

- **Intelligent Manipulation Lab - University of Lincoln (6M-Fixed Term)** — Lincoln, United Kingdom
  Research Assistant — *July 2021 - Present*
  - **National Centre of Nuclear Robotics (NCNR) project** : NCNR has a project demonstration for industrial readiness (level-6). My role includes writing a tele-manipulation network stack for Franka Panda arm as well as ROS control for a mobile base and a (soft) inflatable robot. The demo mimics the scenario of monitoring and deploying a nuclear scanner on a nuclear site using robots for the purposes of decommissioning.
- **GaiTech Robotics** — Shanghai, China
  Project Engineer — *July. 2019 - June 2021*
  - **PicaBot - Research Mobile Robot Platform with 7-DoF Arm**: PicaBot is an integration of a Ria mobile base with Kinova Gen3 robotic arm and Robotiq gripper. My role included writing a complete ROS package. This included creating combined control, MoveIt, MoveBase, vision packages for mobile base, arm, gripper, torso joint, and head pan/tilt camera
  - **Bric - Educational/Research Robotic Manipulator**: Bric is a new 6-DoF collaborative robotic arm from GaiTech Robotics. My role was to write and manage production-level ROS packages for this arm. This included real and simulation packages as well as a UI software for the arm.
- **BioRobotics Lab (Now: IRiS Lab, KAIST University)** — Cheonan, South Korea
  Graduate Research Assistant — *Sept. 2017 - June 2019*
  - **Twisted String Actuators**: The project aims at designing of a framework to synthesize a variable radius pulley which linearizes the input-output position/force behavior of Twisted String based robotic joint.
  - **Vine Robot and Shared Tele-operation**: The objective of this project is to apply sketch-based tele-operation strategies developed by an alumni onto a real Vine robot which is a collaborated project with CHARM labs in Standford University.
- **EDVON Robotics** — Karachi, Pakistan
  Software Developer and Workshop Instructor — *Jan. 2016 - April 2017*
  - **EDVON 2.0**: Managing company's software stack and customizing it whenever required.
- **Freelance Work**
  Python/LabVIEW/ROS/C++ Programming — *Jan. 2016 - Present*
  - **ROS support package for Yaksawa GP25 robot**:
  - **CapnoTrainer Deaktop Software**: This software is used with capnography hardware to monitor clients' CO2 level during breathing. It also helps to analyze dysfunctional breathing habits in clients and correct them
  - **InMoov Prosthetic Hand with Custom Hand Gesture**: The project aimed to actuate an open-source InMoov prosthetic hand with customized hand gestures using Myo armband to increases hand mobility
  - **Eye Cornea tracking using PiCamera**: An application for tracking cornea and utilizing the data as 2D spatial information for cursor movements for quadriplegic people.
  - **Kinect Learning Application**: This application was designed for a museum in Karachi for better interaction of visitors with museum's collections. The objective of this application was to provide information in interactive way for the museum visitors.
  - **Miscellaneous Projects**:
    Other miscellaneous projects are available on my Youtube channel.

Projects

- **Rhino XR4 Robotic Arm Controller**: *Graduation Thesis*
- **Sentiment Analysis Software**: Open source Python-based project with easy to use GUI for sentiment analysis by retrieving tweets using Twitter API .
- **Digital Stenography**: Open source Python-based project to hide (and retrieve) huge amount of text in video files without loss of quality
- **Semantic Analysis**: My attempt at Quora challenge to find semantic similarity between a pair of questions using word embeddings and supervised learning algorithms

Publications

- : **Muhammad Arshad Khan**, Bhiraj Suthar, Igor Gaponov, Jee-Hwan Ryu, "Single Motor-based Bidirectional Twisted String Actuation WithVariable Radius Pulley", RA-L 2019, *Accepted*
- : **Muhammad Arshad Khan**, Bhiraj Suthar, Igor Gaponov, Jee-Hwan Ryu, "Design of Variable Radius Pulley for Linearized Input-Output Transmission Characteristics of Twisted String Actuator, AMSM 2019 *Accepted*
- : Hyeon-seok Seong **Muhammad Arshad Khan**, Bhiraj Suthar, Igor Gaponov, Jee-Hwan Ryu, "Twisted String based Hip Joint Exoskeleton, AMSM 2019 *Accepted*
- : Kashan Aqeel, Urooj Naveed, Faarah Fatima, Farah Haq, **Muhammad Arshad**, Ammar Abbas, Muhammad Nabeel and Muhammad Khurram, "Skin Stroking Haptic Feedback Glove for Assisting Blinds in Navigation", ROBIO2017, China, *Accepted*

Technical Skills

- **Languages**: C++, Python, NodeJS, LabVIEW
- **Frameworks**: ROS, VueJS, ElectronJS
- **Others**: Git, OpenCV, LaTeX
- **Software**: SolidWorks, Proteus