Muhammad Umer Khan Niazi (우머)

Designer | Robotics Graduate | Mechanical Engineer

서울특별씨, 대한민국

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https://fujinniazi.github.io/portfolio/

SKILLS

Fusion 360 (Autodesk)
Proficient

Communication and Teamwork
Proficient

Solidworks
Intermediate

Prototyping
Proficient

MATLAB
Beginner

Python
Beginner

React
Beginner

CSS
Beginner

LANGUAGES

English
Fluent/ Native

Korean
Advanced Beginner

VOLUNTEER EXPERIENCE

Independent Tutoring
Part-time

- Teaching students how to improve their free-talking and spoken English skills.
- Coaching students on what and how to prepare for the TOEFL exam.

KAIST Mentor Program
Mentor

- Providing help and guidance to international graduate freshmen coming into KAIST.

NUST Blood Donation Drive
Event Manager

- Organization of two events for the collection of blood in coordination with a hospital's blood bank.

NUST Community Services Club
Event Manager

- Managing the execution of various nonprofit events being held by NUST Community Services Club (NCSC).

AWARDS

Graduate Scholarship
한국과학기술원, 대한민국

Undergraduate Scholarship
NUST, Pakistan

Merit Scholarship
Fauji Foundation, Pakistan

CERTIFICATIONS

TOEFL iBT
112/120

GRE
315/340

EDUCATION

Korea Advanced Institute of Science and Technology (한국과학기술원), 대한민국 (September 2019 - August 2021)
Masters of Robotics Engineering, Rehabilitation
3.75/4.3

Courses: *Rehabilitation Engineering, Soft Robotics: Biomimetic Systems, Deep Learning, Probability and Statistics, Mobile Robotics*

National University of Science and Technology (NUST), Pakistan (September 2014 - August 2018)
Bachelor of Mechanical Engineering
3.42/4

Courses: *Robotics and Automation, Theory of Machines, Mechanics of Materials, Statics and Dynamics, Programming, Mechatronic Design*

WORK EXPERIENCE

HEART Lab (의공학연구소 서울아산병원), 대한민국 (January 2022 - Present)
Researcher (영구원)

- Working on the design of an origami-based flexible retraction mechanism for use in combination with a continuum robot during surgery.
- Designing a continuum robot which utilizes a bistable snapping mechanism to partially lock and to achieve a wider field of reach for use during transoral surgery.
- Modeled and manufactured a holder for attachments added to a mapping catheter.

Keywords: *Continuum Robot, Bi-Stability, Compliant Mechanisms, Fusion 360, 3D Printing*

Neuro-Rehabilitation Lab (한국과학기술원), 대한민국 (September 2019 - August 2021)
Graduate Researcher

- Designed a novel origami pattern (originating from a water bomb pattern) for use as a mechanism for a passive upper limb support device.
- Manufactured a monolithic version of the aforementioned pattern utilizing torsional parallel surrogate folds with an inherent stiffness.
- Designed and manufactured an ergonomic wearable brace to allow for the mechanism to be easily and comfortably mounted on the patient's body.

Keywords: *Adapted Origami, Surrogate Folds, Rehabilitation, Solidworks, 3D Printing*

VisionX Lab (CIE NUST), Pakistan (March 2019 - June 2019)
Design Engineer

- Designed and constructed kiosk prototypes for automated shopping systems.
- Worked on the design and modeling of an automated Smart Cart.
- Developed an enclosure for an automated cart detection and recognition system.

Keywords: *Enclosure Design, Shopping Cart Design, Solidworks, Manufacturing*

RISE Lab (NUST), Pakistan (August 2017 - February 2019)
Undergraduate Researcher

- Developed a bio-inspired hybrid actuator inspired from crustacean exoskeletons by incorporating rigid shells and a soft core.
- When actuated, the biomimetic actuator produced forces upto 11.5N at 135KPa (satisfying the required criteria of 8N for palm grasping).
- Utilized the actuator as a supernumerary sixth finger for rehabilitation and robotic grippers.

Keywords: *Hybrid Actuator Design, Rehabilitation, Molding, ABAQUS, Solidworks, 3D Printing*

Mercedes (Shahnawaz Motors), Pakistan (August 2016 - September 2016)
Technician Assistant (Intern)

- Worked with a team on the shop floor to find and solve problems with Mercedes Vehicles.
- Worked on the dismemberment of a V8 Engine to replace its cylinders.

Keywords: *Problem Analysis and Solving, Team-work, Engine Assembly*

PROJECTS

Guided Generation of Neural Paths (Rehabilitation, Study Design)

Designed and theoretically analyzed a protocol for the rehabilitation of stroke patients by guiding the generation of neural paths through intention based Transcutaneous Magnetic Stimulation (TMS).

Thermal Image Generation and Classification (Python (Pytorch), Model Integration)

Development of two integrated models, the first being a GAN model for the generation of thermal images from ordinary images and the second for the classification segmentation of the thermal images for post processing.

Human Powered Vehicle (3D Modeling, Simulation)

Design and development of a low tri-wheeler recumbent vehicle for participation in the ASME HPV Competition. The frame was also structurally and aerodynamically analyzed using ANSYS.

PUBLICATIONS

Bhatia, Divij, Kyoung-Soub Lee, Muhammad Umer Khan Niazi, and Hyung-Soon Park. "Triboelectric nanogenerator integrated origami gravity support device for shoulder rehabilitation using exercise gaming."
Nano Energy 97 (2022): 107179.