

Mohammad Zainullah Khan

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EDUCATION

UNIVERSITY OF DAYTON

MASTERS IN MECHANICAL ENGINEERING | Conc. Robotics & Automation
Jan 2022 - Dec 2023 | Dayton, OH, United States

Thesis: Task Allocation and Dead-Lock-Free Path Planning for Industrial Collaborative Multi-Robotic System

GPA: 4.0 / 4.0

GHULAM ISHAQ KHAN INSTITUTE OF ENGINEERING SCIENCES AND TECHNOLOGY (GIKI)

BACHELOR OF SCIENCE IN MECHANICAL ENGINEERING

Aug 2014 - Jun 2018 | Topi, KPK, Pakistan

Secured 1st position out of 100 students in the department

GPA: 3.89 / 4.0

EXPERIENCE

UNIVERSITY OF DAYTON | GRADUATE RESEARCH ASSISTANT

Jan 2022 - Present | Dayton, OH

- Developing multi-robot path planning for industrial automation applications, including welding, painting, material handling, and manufacturing operations, with the goal of boosting production efficiency by 60%.
- Designed a novel means of actuation of spatial mechanisms via SPS chain that eliminates singularity, leading to a research publication.
- Conceptualized and designed an automated, pneumatically controlled smart hose for use in subtractive manufacturing operations, utilizing image processing to improve safety and increase productivity.

UNITED ENERGY PAKISTAN LIMITED | OPERATIONS ENGINEER

Jul 2018 - Nov 2021 | Badin, Pakistan

- Took the initiative to develop and implement a Lubrication Management system, resulting in cost savings of \$110k/yr and earning a recognition award. It provided inventory management, visibility of lube oil consumption and optimum distribution of lube oil based on OEM benchmarks & equipment condition.
- As part of maintenance & reliability team, I collaborated in planning, optimizing, and executing machine maintenance, as well as troubleshooting failures.

RECKITT BENCKISER | INTERN, SUPPLY SERVICES

Jul 2017 - Sep 2017 | Karachi, Pakistan

- Leveraged automation and engineering skills to optimize the manufacturing lineup and embellishment process, resulting in annual savings of \$30,000.

PROJECTS

White Board Drawing Robot

Controlled using Arduino micro-controller, it can draw images captured from webcam or uploaded to it on a whiteboard using two different markers. Makes use of image processing for converting images into line traces and PID control for DC motors.

Stewart Platform - Design, Analysis, Modeling and Simulation

Developed equations, performed inverse kinematics (in MATLAB), and simulated in Simscape. It was actuated using both joint motion (kinematic actuation) and force (dynamic) actuation, via feedback control using PID controller.

Robotic Arm with 4 Degrees of Freedom mounted on a Mobile Base

Built a remote-controlled manipulator on a differential drive base, capable of obstacle avoidance using onboard sensors and precise motion using feedback control.

Self Balancing Motorcycle Prototype

It uses inertial sensing and flywheel control to self-balance and maneuver.

SKILLS

PROGRAMMING

Python • MATLAB • C/C++ • \LaTeX •

PLC • Embedded C

SOFTWARE & OS

CAD (SolidWorks, PTC Creo) • ROS • Linux (Ubuntu) • Ultimaker Cura • MATLAB (Simulink, Simscape, Stateflow) • ANSYS • Git • Microsoft Office (Word, PowerPoint, Power BI, certified in Excel) • RoboDK

LANGUAGE

English (Proficient) • Urdu (Native) • Hindi (Proficient)

AWARDS

Academic Gold Medal for securing the highest position in the department.

Winner of Reckitt Benckiser's nationwide design competition (\$4,500 prize).

Best Young Author Award for book chapter on 3D scanners.

COURSEWORK

Graduate

Robot Kinematics & Modeling (+ TA)

Applied Robotics

Autonomous Systems

Analytical Dynamics

Automatic Control Theory

3D Printing & Prototyping

Online Courses

Python3 for Robotics

Linux for Robotics

Git & GitHub Basics for Robotics

Intro to AI

Modern Robotics: Robot Motion

INVOLVEMENT

Current

Member, American Society of Mechanical Engineers (ASME)

YouTube Channel- Engineering Simplified

Past

Event Coordinator, Design, Build and Fly Competition (DBFC)

Event Coordinator, Muslim Student Association (MSA)

Technical Head, The American Institute of Aeronautics and Astronautics (AIAA).

MORE

3 Publications including in peer-reviewed journal & book chapter.

Invited x2 to Cisco to deliver Keynote sessions on Robotics, AI & ChatGPT.