# MUHAMMAD USAMA NOORANI

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## PERSONAL STATEMENT

A dedicated textile engineer and researcher with a strong academic foundation from NED University and ongoing doctoral research in wearable materials. Passionate about contributing to academia through teaching, research supervision, and the development of innovative textile technologies. Committed to fostering student growth and advancing research excellence within the textile engineering discipline.

## EDUCATION

**PhD in Wearable Sensors for Health Monitoring (Fully Funded)**| Coventry University, UK
SEP 2021 – JUN 2026 (Expected)
Project: Nanotechnology-based wearable PPG sensor for cardio-respiratory monitoring.
**Master of Science in Textile Management** | NED University of Engineering & Technology, Pakistan
NOV 2019 – APR 2021 CGPA: 3.85/4.00
Thesis: Investigation and Characterization of Textile-based Actuators for Medical Applications.
**Bachelor of Science in Textile Science** | NED University of Engineering & Technology, Pakistan
DEC 2015 – AUG 2019 CGPA: 3.85/4.00
Thesis: Development of Textile-based Hand Exoskeleton for Post-Stroke Rehabilitation.

## EXPERTISE

- Strong command of polymeric materials, functional coatings, and textile-integrated sensors, with practical experience in mechanical testing and material characterization.
- Experience in supervising undergraduate research projects and guiding students in experimental methods and report development.
- Skilled in delivering lab-based instruction and supporting faculty in academic evaluation, including quizzes, practical assessments, and coursework.
- Proficient in FEA simulations using ABAQUS CAE, with a focus on stress analysis and optimization of soft robotic textile structures.
- Experienced in interdisciplinary research, collaborating with industry partners on wearable technology and healthcare textile innovations.
- Competent in academic writing, preparation of grant proposals, technical documentation, and dissemination of research output through conferences and publications.

## ACADEMIC AND RESEARCH EXPERIENCE

**Research Associate** | Department of Textile Engineering
NED University of Engineering & Technology, Pakistan | NOV 2019 – MAY 2021

- Conducted research on textile-based soft robotics, wearable technologies, and healthcare textiles.
- Designed fabrication methodologies for knitted soft actuators and rapid prototyping.
- Developed testing platforms to evaluate performance parameters of soft robotic systems.
- Performed simulation and modelling of textile-integrated soft robots using ABAQUS CAE.
- Supervised undergraduate research projects and guided students in experimental work.
- Assisted in managing project timelines, resources, and research budgets.
- Prepared research proposals and grant applications to secure funding.
- Contributed to the establishment and renovation of the Smart Textiles Laboratory.
- Supported academic responsibilities including quiz assessment, invigilation, and preparation of course materials.

**Post Graduate Researcher (Fully Sponsored)** | Centre of Intelligent Healthcare
Coventry University, UK | SEPT 2021 – MAY 2025

- Development and mechanical characterization of super-thin skin adhesive substrates for wearable sensor applications
- Optimization of PDMS-based substrate properties using FEA simulation (ABAQUS CAE) to enhance adhesion, minimize bulging, and reduce motion artifact interference
- Design and testing of PPG-based wearable sensors for cardio-respiratory monitoring

## Publications

- Knitted Pneumatic Actuators for Soft Robotics: Influence of Material and Geometric Parameters, 2025 (under review)
- Modelling method to evaluate the thermo-regulating behaviour of micro-encapsulated PCMs coated fabric, Industria Textila, 2022.
- Productivity Improvement in the Denim Industry by DMAIC Methodology, International Journal of Innovation, Creativity and Change (2021)
- Performance evaluation of hot mix asphalt using textile waste, Industria Textilă, 2021

## Skills

**Academic & Teaching Skills**

- Undergraduate Supervision & Research Guidance
- Laboratory Instruction in Textile Engineering (Advanced Fabric Manufacturing, Knitting Technology, Technical Textiles)
- Assessment Support (Quizzes, Lab Reports, Academic Evaluation)
- Academic Writing & Development of Teaching Materials

**Research & Professional Skills**

- Research Proposal Development & Grant Preparation
- Experimental Design & Material Characterisation
- Industry Collaboration & Innovation Integration
- Conference Presentation & Technical Communication

**Technical Competencies**

- ABAQUS CAE (FEA Simulation)
- MATLAB & Python (Data Analysis / Modelling)
- Textile Testing Instruments & Characterisation Techniques

## Research Interests

- Smart Textiles and Wearable Sensor Technologies
- Textile-Based Soft Robotics and Actuating Materials
- Technical Textiles
- Fabric Manufacturing
- Spinning

## Awards and Honors

- Runner-Up Research Representative of the Year, Coventry University, May 2023
- 2nd Position for Oral Presentation, Centre of Intelligent Healthcare Research Showcase, Apr 2022
- 1st Prize at 5th All Pakistan DICE Innovation Event for Sustainable Textile Innovation, Mar 2020
- AATCC Student Chapter Award, Mar 2020
- Gold Medal in BS Textile Science for 1st Class 1st Position, Dec 2019