

Syed Hammad Hussain Shah

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Education

Norwegian University of Science and Technology-(NTNU)

Norway

PHD COMPUTER SCIENCE (THESIS TITLE: ADVANCED INTERACTIVE TECHNOLOGIES FOR GROUP FUNCTIONAL

2020 - 2024

TRAINING IN ELDERCARE: DESIGN AND DEVELOPMENT (SUBMITTED))

- Advisor: Prof. Ibrahim A. Hameed

Sejong University

South Korea

MS COMPUTER SCIENCE (CGPA: 4.42/4.5 , PERCENTAGE: 98.4%)

2018 - 2020

- Advisor: Prof. Jong-Weon Lee

COMSATS University Islamabad (CUI)

Pakistan

BS SOFTWARE ENGINEERING (CGPA: 3.7/4.0, PERCENTAGE: 86.9%)

2013 - 2017

Experience

Doctoral Researcher

Norway

SOCIAL ROBOTS LAB, DEPARTMENT OF ICT AND NATURAL SCIENCES, NORWEGIAN UNIVERSITY OF SCIENCE AND

TECHNOLOGY

2020 - 2024

- Codesigned and developed healthcare technologies based on AI, social robots, and Virtual Reality (VR).
- Data collection, preparation, exploration, statistical analysis and development of machine learning models for healthcare applications.
- Developed deep learning-based human activity recognition framework for healthcare applications.
- Designed data collection methods, conducted user studies, and analyzed data to gain insights into users' perceptions.
- Hands-on experience with Oculus Quest, Hololens 2, and humanoid robots such as Pepper and NAO robot.
- Skills:** C#, .NET, Unity3D Game Engine, Python, Keras, ROS, NumPy, Pandas, Statistical analysis, User research, User-centered design

Research Assistant

South Korea

MIXED REALITY AND INTERACTION LAB, SEJONG UNIVERSITY

2018 - 2020

- Developed XR (VR, AR, MR) applications focused on sectors of multimedia entertainment and air traffic control.
- Applied user-centered design process involving requirements gathering, software development, and testing for better UX.
- Developed authoring tool for 360° VR entertainment based on saliency-based object tracking.
- Skills:** C#, .NET, Unity3D, Python, OpenCV, UX design, User research, HCI research, User statistics, Data analysis

Full-stack Web Developer

Pakistan

SOFTWARE DEPARTMENT, COMSATS UNIVERSITY ISLAMABAD (CUI)

Jul. 2017 - Nov. 2017

- Designed and developed web applications as full-stack developer involving backend and frontend development.
- Followed agile software development practices for continuous requirements analysis, user feedback, and usability testing.
- Skills:** Database design and development, C#, .NET, REST APIs, SQL, Entity framework, JavaScript, HTML, CSS, Web Forms, MVC

Skills

- Programming:** Python, C# (.NET), C++, Javascript, Apache Spark
- Public Libraries:** Tensorflow/Keras, OpenCV, Pandas, NumPy
- Databases:** MSSQL, Entity Framework, Relational Database Design
- CI/CD Tools:** Azure DevOps
- MLOps:** Azure Machine Learning (Azure ML), MLFlow
- Cloud Data Integration & Analytics:** Azure Data Factory (ADF), Databricks
- Environments & IDE:** Visual Studio, Unity3D game engine, ROS, Windows, Linux
- Software Development:** Software Development Lifecycle (SDLC), Agile Methodology
- Research:** Statistical Analysis, Qualitative Data Analysis, Writing and Reviewing, Team Collaboration
- Languages:** English (fluent), Norwegian (basic), Urdu (native)

Projects

Social VR (Metaverse)-based Collaborative Exergame for Elderly Users

NTNU, Norway

IMMERSIVE TECHNOLOGIES, HUMAN-CENTERED DESIGN & USER RESEARCH

- Codesigned and developed social VR-based exergame supporting rehabilitation of elderly users.
- **Skills:** XR, VR, C#, Unity3D game engine, Human-centered design, UX design

An Efficient and Lightweight Multiperson Activity Recognition Framework

NTNU, Norway

PYTHON, DEEP LEARNING & ROBOTICS

- Developed an LSTM-based deep learning framework for multiperson activity recognition based on visual data for surveillance and robot-assisted healthcare applications.
- **Skills:** Artificial Intelligence, Deep Learning, Python, Keras, LSTM, OpenCV, NumPy, ROS, User research

Multi-agent Robot System to Monitor and Enforce COVID-19 Rules in Large Areas

NTNU, Norway

PYTHON, DEEP LEARNING & ROBOTICS

- Developed a multi-agent system based on multiple CCTV cameras and robots that monitor and enforce physical distancing constraints in large areas to combat COVID-19.
- **Skills:** Artificial Intelligence, Deep Learning, Python, Keras, YOLO, OpenCV, NumPy, ROS

Intelligent Holographic Mixed Reality-based System for Health Data Management

NTNU, Norway

IMMERSIVE TECHNOLOGIES, PYTHON, COMPUTER VISION & USER RESEARCH

- Designed and developed a mixed reality-based system that leverages Microsoft Hololens for work practices in nursing homes.
- **Skills:** XR, VR, C#, Unity3D game engine, Hololens, Human-centered design, UX design, User research

A Holographic Mixed Reality (MR) system for air traffic control and management

Sejong University, South Korea

IMMERSIVE TECHNOLOGIES, HUMAN-CENTERED DESIGN & USER RESEARCH

- Codesigned and developed holographic MR-based application to improve productivity in tasks performed at air traffic control towers.
- **Skills:** XR, MR, C#, Unity3D game engine, Hololens, Human-centered design, UX design, User research

VR Authoring Tool for 360° Entertainment

Sejong University, South Korea

IMMERSIVE TECHNOLOGIES, PYTHON, COMPUTER VISION & USER RESEARCH

- Developed an authoring tool supporting the production of multiple VR experiences of a 360° video based on tracking and sharing of users' experiences in VR, or saliency-based object tracking in 360° video.
- **Skills:** XR, VR, C#, Unity3D game engine, Python, OpenCV, Object tracking, User research

Web-based Student Application Management System

CUI, Pakistan

WEB

- Developed web application for student application management that allows university students to submit applications online, which go through an online verification process by the concerned departments, i.e., exams, finance, etc., reaching a final decision.
- **Skills:** C#, ASP.NET, HTML, CSS, JavaScript, SQL, NoSQL, Entity Framework

Publications

Journal and Conference

- **Shah, S. H. H.**, Karlsen, A. S. T., Solberg, M., & Hameed, I. A. (2024). Social VR and humanoid social robots for gamified physical exercise: Comparative evaluations by elderly users. *Computers in Human Behavior*. (IF: 9.9) – Under Review
- **Shah, S. H. H.**, Karlsen, A. S. T., Solberg, M., & Hameed, I. A. (2024). An efficient and lightweight multiperson activity recognition framework for robot-assisted healthcare applications. *Expert Systems with Applications*, 241, 122482. (IF: 8.5)
- **Shah, S. H. H.**, Karlsen, A. S. T., Solberg, M., & Hameed, I. A. (2023). A social VR-based collaborative exergame for rehabilitation: codesign, development and user study. *Virtual Reality*, 27(4), 3403-3420. (IF: 4.2)
- Please visit [Google Scholar](#) profile to find all publications.

Honors & Awards

2020-2024 **PhD Fellowship**, Norwegian University of Science and Technology–(NTNU)

Norway

2018-2020 **Fully Funded Scholarship for Masters Studies**, Sejong University

Seoul, South Korea

2017 **Silver Medal awarded for academic excellence and securing second position in bachelor**,

COMSATS University Islamabad (CUI)

Pakistan

References

Available upon request.