

# Taha Arshad Shaheen

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## EDUCATION

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### PhD Student, Computer Science

August 2023 - Present

Arizona State University, USA

- Advisors: Yu "Tony" Zhang

### Master of Informatics, Social Informatics

March 2023

Kyoto University, Japan

- Advisors: Dražen Bršćić, Takayuki Kanda
- Awarded Distinguished Master's Thesis Award in Feb 2023

### Bachelor of Engineering, Electronic Engineering

2017

NED University of Engineering and Technology, Karachi, Pakistan

- CGPA: 3.698/4.0
- Ranked 5th in graduating batch of 148

## PUBLICATIONS

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### ACM Transactions on Human-Robot Interaction

April 2023

Manuscript Submitted and Under Review

1. Shaheen, T., Bršćić, D., Kanda, T. *Investigation of Low-Moral Actions by Malicious Anonymous Operators of Avatar Robots*

## EXPERIENCE

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### POSTER PRESENTATIONS

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#### IEEE International Conference on Robotics and Automation (ICRA)

May 2023

London, UK

- Participated in the Workshop on 'Avatar-Symbiotic Society'. Presented online an abridged version of my submission to ACM Transactions on Human-Robot Interaction.

#### The 2nd Avatar Symbiotic Society Conference

Jan 2023

Osaka, Japan

- Presented my Masters research on the Low-moral Actions of Malicious Anonymous Operators of Avatar Robots.

### RESEARCH EXPERIENCE

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#### Graduate Researcher

October 2020 – Present

Human-Robot Interaction Lab, Kyoto University

- Advisors: Dražen Bršćić, Takayuki Kanda
- Investigating prevention of misuse of avatar robots by anonymous malicious operators.
- Designed and executed hazard-identification workshops with potential users to generate taxonomy of low-moral actions possible through avatar robots.
- Wrote manuscript to be submitted to a peer-reviewed journal.

**Research Assistant****Nov 2018 – Sept 2020***NCAI, NED University of Engineering and Technology*

- Employed in Neurocomputation Lab under National Center of Artificial Intelligence (NCAI) funded by the Pakistan Higher Education Commission.
- In collaboration with Center for Autism, Rehabilitation & Training Sindh (C-ARTS), Dow Institute of Physical Medicine and Rehabilitation (Dow-IPMR), and Center for Autism Karachi, engineered two low-cost socially assistive robots and investigated their use in autism therapy.
- Functioned as external advisor for 12 undergraduate students whose final-year projects were associated with robots for autism. Held weekly meetings and monthly progress reports. Arranged visits to centres for autism for training and observation.

**Intern****Summer, 2015***Electronic Design Centre, NED University of Engineering and Technology*

- As part of a team, tested and diagnosed electronic modules based on the Intel 8086 microprocessor. Programmed the modules in Assembly.
- Later replaced 8086 with an Arduino to expand the capabilities of the modules.

**TEACHING EXPERIENCE****Graduate Teaching Assistant****Spring Semester, 2022***Department of Social Informatics, Kyoto University*

- Class: Information System Analysis. Covered basic machine learning and data mining.
- Helped graduate students with study material, programming exercises, technical issues, and final class project.

**Group Leader****Nov 2021 – Present***Empowerment Program, ISA*

- Lead groups of Japanese high school students in intensive programs designed to improve their English speaking, presentation, and discussion skills. Topics included the UN's Sustainable Development Goals, positive thinking, technology, personal identity, diversity, and critical thinking.

**Instructor, DIY Science Course****May – Sept 2016***Merit n Merit Coaching Center, Karachi*

- Taught a course centred on Arduino, basic electronics, and robotics. Students ranged from 6th grade to 12th grade.

**Instructor, Course on Design and Fabrication of PCBs****March 2016***NED University of Engineering and Technology, Karachi*

- Designed and taught a 16-hour summer course to undergraduate students on design and fabrication of printed circuit boards.

**INDUSTRY EXPERIENCE****Fatima Fertilizer Company, Sadiqabad, Pakistan****Nov 2017 – Nov 2018***Graduate Trainee Engineer, Instrumentation and Control*

- Oversaw day-to-day maintenance jobs at Offsites & Utilities and Nitric Acid plants.
- Received training in documentation, field instrumentation, Bentley Nevada vibration monitoring system, anti-surge control, Gas Turbine Generator operation, Waste Gas Boiler operation, Yokogawa DCS and ESD, process safety management elements, and work procedures.
- Supervised training of interns and junior trainee engineers.

## VOLUNTEER WORK

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### Volunteer Assistant

Oct 2022

*IROS 2022, Kyoto, Japan*

- Helped organizers during pre-planning phase set up PCs and Zoom Webinars for online streaming of the conference. Assisted session chairs and speakers, and handled the functioning of equipment and computers during the conference.

### Volunteer Assistant

Oct 2022

*ROSCon 2022, Kyoto, Japan*

- Helped organizers set up the welcome booth. Guided participants, exhibitors, and speakers.

### International Student/Guide

Summer 2022 – Present

*WAK Japan, Kyoto, Japan*

- Tour guide in Kyoto for groups of Japanese high school students hailing from different prefectures of Japan. Converse in English to increase students' confidence in speaking a foreign language. Introduce them to Pakistani culture.
- Introduce patrons of Sekai Cafe (World Cafe) in Kyoto to Pakistani culture, traditions, language, and clothing through presentations and conversations.

### Field Officer

March 2019 – April 2020

*1947 Partition Archive and Stanford University Libraries*

- Supervised and assisted three volunteers in rural Sindh and Karachi in recording and preserving the life stories and oral histories of witnesses of the 1947 Partition of British India. Collectively recorded 90 stories.

### Oral History Apprentice

April 2016 – July 2017

*1947 Partition Archive*

- Located and interviewed 83 witnesses of the 1947 Partition of British India to preserve their life stories and oral histories.
- Organized two events called Voices of Partition where witnesses and survivors of the 1947 Partition told their stories. First was at Habib University in Karachi and the second was at Sindh Rural Support Organization in Sukkur. Also spoke about my personal experience of recording these life stories at these events.
- Interviewed by BBC Radio for my volunteer work. The documentary titled 'Pakistan, Partition And The Present' can be found at:
  - <https://www.bbc.co.uk/mediacentre/proginfo/2017/32/the-documentary-pakistan-partition-and-the-present>
  - <https://www.bbc.co.uk/programmes/p05b70f4>

## SCHOLARSHIPS AND GRANTS

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### MEXT (文部科学省) Research Scholarship

April 2020 – Present

*Japanese government scholarship*

- Full tuition and stipend until the completion of a PhD.
- Selected on the recommendation of Japanese Consulate General in Karachi after tests and an interview.
- One of only two people selected from Karachi in 2019.

### Final Year Project Grant

2017

*From the Naim Siddique Final Year Project Fund*

- Annual budget of 10,000 USD, managed by the NED Alumni Association at Southern California.
- Monetary sum given depending on perceived cost of project.
- Granted every year to ten teams for best proposals and on recommendation of faculty project advisor.

## SOCIETY MEMBERSHIPS

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### **Pakistan Engineering Council (PEC)**

**2017 – Present**

*Registered Engineer and Lifetime Member*

- The PEC is a statutory body that regulates the engineering profession in Pakistan. It is mandatory for all engineering graduates to be registered with PEC for their qualifications to be considered valid.
- My PEC number is ELECTRO/27494

### **NED Robotics Society**

**2015**

*Member*

- As part of team, designed and programmed robots for inter and intra-university competitions. Designed and printed PCBs. Programmed AVR ATmega32 and ATmega 328, controllers, Arduino boards, and Raspberry Pis for projects.

## NOTABLE PROJECTS

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### **Office Reception Robot**

**2020**

- Augmented Robo-Chotu (see project below) to recognize office employees and guests and learn the faces of people it had not seen before.
- Programmed and created three Android applications to assist office staff.

### **Robot as Emotion Communication Tool for Children with ASD**

**2018 – 2020**

- Worked with therapists and two teams of 4 undergraduate students each to explore the use of an expressive robot as an emotion-communication tool.
- In a pilot, put items such as a birthday hat or a band-aid on the robot. Programmed the robot to also show an appropriate expression on its face. Children with ASD then identified the emotion that matched the situation.
- Rebuilt Robo-Chotu (see project below) for this task. Added natural language processing and communication using Google Dialogflow. Wrote Android app for Wizard-of-Oz control.
- Video of project can be found at <https://www.youtube.com/watch?v=3o5LQfD1xfQ>

### **Robot for Imitation Therapy for Children with ASD**

**2018 – 2020**

- Worked with a team of 4 undergraduate students and therapists from Dow IPMR to augment a Robosapien by WowWee robotics.
- Used OpenPose and an ESP8266 nodemcu to have the robot copy a person's arm positions and to detect when a person had successfully copied the robot's arm position.

### **Smart Home Control**

**2017 and 2018**

- Wrote Android app in Java, designed and made a PCB, and installed electronic components to make a room's appliances (fans and lights) operate via Bluetooth commands.
- Programmed and installed an ESP8266 nodemcu in an air conditioner and set up backend database on Google Firebase. Set up the AC to turn on at a certain time of the day. Also wrote an app to remotely operate the AC through WiFi.

### **Robo-Chotu - Assistive Social Robot**

**2017**

*Final Year Project, NED University*

- Designed a robot, named Robo-Chotu (chotu is Urdu for small), to interact socially with people around it. It delivered speeches and hosted events at NED University of Engineering and Technology and Dow University of Health Sciences.
- Later modified the robot to interact with children on the autism spectrum.
- Utilized C# in the Unity game engine for its animated face, Java for Android to control expressions and Bluetooth connectivity to body, and C++ in Arduino for control of actuators. It also involved mechanical designing.

## SKILLS

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**Programming Languages:** C, Python, Java, C#, C++, R, MATLAB

**Software:** ROS, L<sup>A</sup>T<sub>E</sub>X, Unity, Android Studio, Autodesk Fusion 360, Autodesk Eagle

## CERTIFICATIONS

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### ARTIFICIAL INTELLIGENCE

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**Deep Learning Specialization:** DeepLearning.AI on Coursera 2020

- Instructor: Andrew Ng
- 17 weeks

**Machine Learning:** Stanford University on Coursera 2019

- Instructor: Andrew Ng
- 11 weeks

### ROBOTICS

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**Modern Robotics, Course 1: Foundations of Robot Motion:** 2019

Northwestern University on Coursera

- Instructor: Kevin Lynch
- 4 weeks

**Control of Mobile Robots:** Georgia Institute of Technology on Coursera 2019

- Instructor: Magnus Egerstedt
- 7 weeks

### DESIGN

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**Human-Centered Design: an Introduction:** UC San Diego on Coursera 2019

**Design Principles: an Introduction:** UC San Diego on Coursera 2019

- Instructor: Scott Klemmer
- 7 weeks total

### COMPUTER AIDED DESIGN

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**Intro to Digital Manufacturing with Autodesk Fusion 360:** Autodesk on Coursera 2019

**Autodesk Fusion 360 Integrated CAD/CAM/CAE:** Autodesk on Coursera 2019

- Various instructors
- 9 weeks total

### WRITING

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**Writing in the Sciences:** Stanford University on Coursera 2019

- Instructor: Kristin Sainani
- 8 weeks

## REFERENCES

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### **Takayuki Kanda**

*Kyoto University, Japan*

- Relation: Master's advisor
- Email: kanda@i.kyoto-u.ac.jp

### **Dražen Brščić**

*Kyoto University, Japan*

- Relation: Master's advisor
- Email: drazen@i.kyoto-u.ac.jp

### **Hashim Raza Khan**

*NED University of Engineering and Technology, Karachi, Pakistan*

- Relation: Teacher, undergraduate final-year project advisor, and employer
- Email: hashim@neduet.edu.pk