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Soroosh Mortezapoor

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Date of birth: 01/02/1988 **Nationality:** Austrian, Iranian

ABOUT ME

As a dedicated engineer and entrepreneur, I thrive on solving problems and creating innovative solutions. With several years of experience in the dynamic startup ecosystem, including serving as the CTO of a fast-paced Austrian startup, I have built and led expert teams while collaborating with renowned multinational business clients in the B2B SaaS sector.

In 2019, I decided to pursue my Ph.D. at TU Wien, focusing on the intersection of Robotics, Virtual Reality (VR), and Augmented Reality (AR). This academic journey has allowed me to merge my technical and management expertise with cutting-edge research, complemented by teaching responsibilities. These experiences have given me a comprehensive understanding of my passions: building solutions to complex challenges and exploring uncharted territories of science, engineering and technology.

WORK EXPERIENCE

[04/2022 – Current]

University Assistant

TU Wien

City: Vienna | **Country:** Austria | **Name of unit or department:** VR & AR Group, Institute of Visual-Computing and Human-Centered Technology

I do interdisciplinary research on the applications of robots in VR, AR, and MR. This involves designing and constructing robotic systems, enhancing stationary and mobile robotic platforms, and programming these systems at various levels. At TU Wien, I teach courses about Multimedia in Game Engines, Multimodal Interfaces, ROS (Robot Operating System), and Virtual Reality, and also provide student supervision.

[05/2020 – Current]

FWF Project Assistant - Ph.D. Candidate

TU Wien - Vienna University of Technoloty https://informatics.tuwien.ac.at/people/soroosh-mortezapoor

City: Vienna | **Country:** Austria | **Email address:** soroosh.mortezapoor@tuwien.ac.at | **Name of unit or department:** Institute of Visual Computing and Human-Centered Technology | **Business or sector:** Professional, scientific and technical activities

Working as a Ph.D. researcher on the SFB project "Robotics; Large-Scale Haptic Interactions in Virtual Reality, Based on a Mobile Robotic Platform". The project “SFB Advanced Computational Design” brings a large number of scientists together from various research groups from Vienna University of Technology (TU Wien), Graz University of Technology (TU Graz), and the University of Innsbruck. The main questions it is trying to answer are how to advance design tools and processes through multi- and interdisciplinary basic research in digital architecture, integrated building design, computer graphics and virtual reality, discrete and applied geometry, and computational mechanics.

Within this project, my primary focus involves working on the a mobile ROS-based robotic platform, along with advanced sensors and devices used in Virtual, Augmented, and Mixed Reality.

[2016 – 2020] **Chief Technology Officer (CTO)**

Nativy Translations (GmbH)

City: Vienna | **Country:** Austria

Nativy was a professional, high-quality translation and content platform that automated the entire process of human-translating content-sensitive documents as one of the leaders in its domain. While its primary clients included multinational and multilingual companies such as Siemens, RWE, REWE, Western Union, Heineken, and Do&Co, private individuals also benefited from the platform's ease of use to have their documents translated with just a few clicks. Additionally, Nativy provided its partners, including WPML, the capability to offer translation services directly within their CMSs, portals, and websites, eliminating the need for file imports and exports through a ready-to-use API set.

My role in Nativy included but not limited to:

- Head of the software development unit
- Building and training an offshore software development team
- Creating and training an on-site software development team
- Redesigning the platform (Architecture, Technology, etc.)
- Designing and implementing algorithms and procedures such as
    - Expert retrieval systems
    - High-performance resource scheduling systems
    - Text processing and CAT (Computer-Aided Translation) tools
- Supervising and implementing Software Development Lifecycle (SDLC) processes and development methodologies (mainly SCRUM)
- Supervising Continuous Integration (CI) and Continuous Delivery (CD) implementation using Microsoft Azure Pipelines
- Supervising the software testing team (Manual testing, and automated unit/API/Functional/E2E testing)

Nativy employed a wide variety of technologies, including ASP.NET WebForms/MVC, Java, Apache Solr, Apche Lucene, Microsoft Azure Services, Amazon Web Services (AWS), etc.

[2013 – 2016] **Lead Developer**

Nativy Translations (GmbH)

City: Vienna | **Country:** Austria

During this time, I refactored the code base, redesigned the database, and made fundamental changes in UI/UX of the platform.

Some technologies and platforms we introduced into the system included but not limited to:

- Switching to the latest .NET Framework
- Moving the majority of resources to the cloud (Microsoft Azure, Amazon AWS, ...)
- Employing Apache Lucene, Apache Tika, etc. for different purposes in the system
- Introducing and utilizing Linq2SQL ORM
- Introducing new workflows for the ordering process in the system
- Expanding Nativy Connect API, an API set for partner companies
- Switching to AJAX-based pages designed using native HTML/CSS/JS from Telerik ASP.NET Components

[2011 – 2012] **Software Architect and Developer**

Zigoora

City: Tehran | **Country:** Iran

A Canadian-Iranian startup. A crowdsourcing translation platform capable of providing high-quality translations supported by a machine translation engine, and its human

members. Despite its very complex concept and workflow, Zigoora was developed using ASP.NET and jQuery.

[2008 – 2012] **Freelance Developer**

City: Tehran | **Country:** Iran

I did various projects with very different sizes. The platforms and technologies I used were mostly:

- .NET Windows Form (C++.NET and C#.NET)
- ASP.NET
- DotNetNuke
- MS Office Access
- MS SQL Server
- ...

[2006 – 2012] **Part-time IT Support/Network Administrator/Software Developer**

Sazeh Aliazh Alborz Ltd.

City: Alborz Industrial Town | **Country:** Iran

Sazeh Aliazh is a middle-sized company that manufactures steel spare parts for various cars, located in Alborz Industrial Town in Qazvin, Iran. In addition to setting up and supporting their Windows-based network, I spent some time developing mini-applications to automize certain workflows in the company.

[2010 – 2011] **Programming Tutor**

Iran University of Science and Technology

City: Tehran | **Country:** Iran

I taught Microsoft C#.NET in two levels, beginner and advanced. I had two classes, each around 10 people from undergraduate students to Ph.D. students from Iran University of Science and Technology.

[2009 – 2010] **Teacher (Programming)**

Iranian Organization for Development of Exceptional Talents

City: Qazvin | **Country:** Iran

I taught middle-school and high-school children computer programming, as a complementary part to their primary curriculum.

[2004 – 2010] **IT Support/Network Administrator**

Alborz Pooladin 2000 Ltd.

City: Alborz Industrial Town | **Country:** Iran

Alborz Pooladin 2000 Ltd was a small/middle-sized company back then that manufactured steel spare parts for various car manufacturers in Iran. I set up and maintained their Windows-based network and maintained and supported their IT infrastructure technically.

[2008 – 2009] **Software Engineering Intern**

Hanfekran IT Corp.

City: Tehran | **Country:** Iran

I was appointed to different projects to learn how the software development processes and methodologies look like but mainly focused on extending a cloud-based time attendance software for enterprises. During this time, I became familiar with the fundamentals of teamwork and improved my development skills drastically.

EDUCATION AND TRAINING

[2019 – Current] **Dr. techn. (Ph.D.) - Candidate**

Vienna University of Technology (TU Wien) https://www.vr.tuwien.ac.at/people/soroosh-mortezapoor/

City: Vienna | **Country:** Austria | **Field(s) of study:** Robotics and Haptics in VR | **Thesis:** Robotics; Large-Scale Haptic Interactions in Virtual Reality, Based on a Mobile Robotic Platform

Ph.D. candidate at the Institute of Visual Computing and Human-Centered Technology. A member of the prestigious project "SFB Advanced Computational Design" of The Center for Geometry and Computational Design, TU Wien, Vienna, Austria.

Under supervision of Univ.Prof. Mag.rer.nat. Dr.techn. Hannes Kaufmann

[2013 – 2016] **Dipl.-Ing. (Master of Science)**

Vienna University of Technology (TU Wien) https://informatics.tuwien.ac.at/master/logic-and-computation/

City: Vienna | **Country:** Austria | **Field(s) of study:** Computational Intelligence (Logic and Computation) | **Thesis:** Optimizations and Improvements of Topographic Robotic Grasping using Machine Learning Approaches

Dipl.-Ing. (equivalent to Master of Science in German-speaking countries) in Logic and Computation (Formerly known as Computational Intelligence) with a focus on Artificial Intelligence

Under the supervision of Ao.Univ.Prof. Dipl.-Ing. Dr.techn. Markus Vincze at Automation and Control Institute (ACIN), TU Wien

[2006 – 2011] **Bachelor of Science/Engineering**

Iran University of Science and Technology http://ce.iust.ac.ir/

City: Tehran | **Country:** Iran | **Field(s) of study:** Computer Engineering - Software | **Thesis:** A new priority-based agent communication control mechanism for multi-player games using Machinetta

Major: Software Engineering

Under the supervision of Dr. Behrouz Minaie

[1998 – 2006] **High school diploma**

Iranian National Organization for Development of Exceptional Talents

City: Qazvin | **Country:** Iran |

Mathematics/Physics

LANGUAGE SKILLS

Mother tongue(s): Persian

Other language(s):

English

LISTENING C2 **READING** C2 **WRITING** C2

SPOKEN PRODUCTION C2 **SPOKEN INTERACTION** C2

German

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

NETWORKS AND MEMBERSHIPS

Memberships

VR and AR group, TU Wien **2019 - present**

- Vienna University of Technology

- Roll: Robotics Researcher/ University Assistant
- Supervisor: Prof. Mag. Dr. Hannes Kaufmann

Interactive Media Systems Research Group, TU Wien **2016 - 2019**

- Vienna University of Technology
- Roll: Robotics Researcher
- Supervisor: Prof. Mag. Dr. Hannes Kaufmann

Intelligent Automation Laboratory **2009 - 2011**

- Iran University of Science and Technology
- Roll: Research Assistant
- Supervisor: Assis. Prof. Dr. Peyman Kabiri

2nd Khawrazmi Robotic Competitions November **2009**

- Roll: Technical Committee (TC) member (Referee)
- Field: Search and Rescue

USARSim Developers Community **2010 - 2013**

- Roll: Developer on UT3, UDK
- Designed, developed and supported by NIST

Computer Engineering Scientific Association **2009 - 2011**

- School of Computer Engineering Iran University of Science and Technology
- Roll: Official Elected Member

Robotic Scientific Association **2007 - 2009**

- Iran University of Science and Technology
- Roll: Member

PROJECTS

[03/2019 – Current] **CoboDeck: A Large-Scale Haptic VR System Using a Collaborative Mobile Robot**

CoboDeck is an immersive virtual reality haptic system with free walking support. It provides prop-based encountered-type haptic feedback with a mobile robotic platform. Intended for use as a design tool for architects, it enables the user to directly and intuitively interact with virtual objects like walls, doors, or furniture. A collaborative robotic arm mounted on an omnidirectional mobile platform can present a physical prop that matches the position and orientation of a virtual counterpart anywhere in large virtual and real environments. We describe the concept, hardware, and software architecture of our system.

Link: https://ieeexplore.ieee.org/document/10108410

[01/2021 – 04/2021] **Photogrammabot: Autonomous Indoor Photographer Robot**

A custom robot, made on ROS-based Turtlebot 2 base with a Raspberry Pi 4B controller computer. In this robot, a DSLR camera mounted on a 2 DOF turret is controlled by the onboard computer. The responsibility of the robot is to explore an indoor unknown environment, make a map of the environment and take thousands of photos from different specific angles for digital reconstruction purposes.

This robot has been made and programmed for Illusion Walk KG, Berlin

[2018 – 2018] **Automatic Fully-Monitored Greenhouse**

In this project, a fully automatic greenhouse was implemented and built using Raspberry PI 3B+, which is capable of sensing the environment and make corresponding decisions based on the sensor data. This greenhouse is capable of managing all necessary aspects without any human intervention, including controlling lighting, watering, fertilizer, stabilizing temperature and humidity, airflow control, etc.

Additionally, an implemented web-based interface allows access to the data of the greenhouse from anywhere anytime, in addition to allowing controlled manual operations.

HONOURS AND AWARDS

Honours and awards

- Invited Demo Laval Virtual - Action Origami Haptic End-effector - 2024 Laval, France
- Best project award from ACM Siggraph Emerging Technologies - 2023 LA, USA
- Standing amongst top 40 young Austrian companies with Nativy in 2016, 2017, 2018, 2019
- International Robocup Competitions - 2009 Graz, Austria
- International IranOpen Robocup Competitions - 2009 Qazvin, Iran
- International Robocup Competitions - 2008 Suzhou, China
- International IranOpen Robocup Competitions - 2008 Qazvin, Iran
- Awarded for standing among top 1% at the nation-wide university entrance exam

COMMUNICATION AND INTERPERSONAL SKILLS

Communication and interpersonal skills

I encountered my first significant challenge as a member of a professional team during my undergraduate studies when I participated in Robocup competitions. Working with a fast-paced, young, and enthusiastic team, we competed against top competitors at international RoboCup events. This experience honed my teamwork skills and provided me with excellent presentation abilities, as I delivered presentations at seminars, international competitions, symposiums, and summer schools.

Later, as a development lead at Nativy Translations, I faced the task of communicating with various individuals, including technical experts, domain specialists within my team, partner corporates, and individuals with limited IT knowledge. Initially, it was challenging to discuss technical topics with those who lacked experience in the field. However, I learned to appreciate this challenge as it allowed me to develop the skill of conveying complex concepts in simple terms that everyone could grasp. I came to realize that effective communication is a vital trait for a competent CTO.

Coming back to the university as a Ph.D. candidate and a university assistant, with the responsibility of teaching courses and presenting numerous publications, provided me with valuable opportunities to enhance my communication and presentation skills. Moreover, being part of a remarkable project that involved over 80 esteemed scientists from various universities and fields further elevated my abilities in this regard. In my opinion, this experience has taken my communication skills to a new level.

JOB-RELATED SKILLS

Job-related skills

Team building

Team leadership

Critical and creative thinking

Agile methodologies, especially SCRUM

Problem-solving

DevOps

Software related

- .NET
- Design patterns

- RDB/No-Sql
- Cloud-based solutions and services
- Information retrieval systems (Search Engines)
- Automated testing frameworks
- ...

Robotics related:

- Linux
- C++
- Python
- ROS (Robot Operating System)
- Robot Simulation (Unity, Gazebo)
- Robot control stacks (Control, Localization, Navigation, Exploration)
- Microcontroller programming
- VAL3 - Stäubli robots
- Qualisys tracking system

VR Related:

- Unity
- VR in Unity - OpenXR
- Experience with VR Headsets (VIVE, Quest, Rift)

CERTIFICATIONS

Certifications

- Introduction to Didactics - 2022, Wien, Österreich
  - Certified by Technische Universität Wien
  - Instructor: Dr. Elizabeth Weber
- IEEE-RAS Safety, Security and Rescue Robotics Summer School - 2012, Alanya, Turkey
  - Certified by IEEEE, IEEE-RAS, NIST, Robocup Rescue and Robolit
  - Subject: Safety, Security and Rescue Robotics - Machine Learning Practicals
- ROS RoboCup Rescue Summerschool - 2012, Graz, Austria
  - Certified by European Union, SiAt, Republic of Slovenia, Graz University of Technology and RoboCup Federation
  - Subject: Introduction to ROS (Robot Operating System)
- Data Mining and its Application in Industry and Technology - 2009, Tehran, Iran
  - Certified by Iran University of Science and Technology, Industrial Eng. and Computer Eng. Schools
  - Instructor: Prof. Dr. Gholamreza Nakhaeizadeh, former head of datamining department at Deimler and professor of KIT, Germany
- Application of Data Mining in CRM and Quality Management - 2009, Tehran, Iran
  - Certified by Iran University of Science and Technology, Industrial Eng. and Computer Eng. Schools
  - Instructor: Prof. Dr. Gholamreza Nakhaeizadeh
- Introduction to Data Mining - 2008, Isfahan, Iran
  - Certified by TUV Rheinland Academy
  - Instructor: Prof. Dr. Gholamreza Nakhaeizadeh

PUBLICATIONS

[2024] **Stiffness Simulation with Haptic Feedback Using Robotic Gripper and Paper Origami as End-Effector**

Reference: Vasylevska, Khrystyna, Mohammad Ghazanfari, Kiumars Sharifmoghaddam, Soroosh Mortezapoor, Emanuel Vonach, Hugo Brument, Georg Nawratil, and Hannes Kaufmann.

[2023] **Action-origami inspired haptic devices for virtual reality.**

Reference: Vasylevska, Khrystyna, Tobias Batik, Hugo Brument, Kiumars Sharifmoghaddam, Georg Nawratil, Emanuel Vonach, Soroosh Mortezapoor, and Hannes Kaufmann.

Write here the description...

[2023] **CoboDeck: A Large-Scale Haptic VR System Using a Collaborative Mobile Robot**

Reference: Mortezapoor, Soroosh, Khrystyna Vasylevska, Emanuel Vonach, and Hannes Kaufmann

In *2023 IEEE Conference Virtual Reality and 3D User Interfaces (VR)*, pp. 297-307. IEEE, 2023.

[2022] **Photogrammabot: An Autonomous ROS-Based Mobile Photography Robot for Precise 3D Reconstruction and Mapping of Large Indoor Spaces for Mixed Reality**

Reference: Mortezapoor, Soroosh, Christian Schönauer, Julien Rüggeberg, and Hannes Kaufmann

In *2022 IEEE Conference on Virtual Reality and 3D User Interfaces Abstracts and Workshops (VRW)*, pp. 101-107. IEEE, 2022.

[2021] **Safety and Security Challenges for Collaborative Robotics in VR**

Reference: Mortezapoor, Soroosh, and Khrystyna Vasylevska

In Proceedings of the 1st International Workshop on Security for XR and XR for Security (VR4Sec) at Symposium On Usable Privacy and Security (SOUPS) 2021 (pp. 1-4)