Unnikrishnan RADHAKRISHNAN
Software Engineer | Extended Reality/User research

in linkedin.com/in/unnikrishnanr   github.com/karmakomik
unnik.me   Denmark

Highly motivated and skilled VR/AR specialist with a Ph.D. in Virtual Reality and 10 years of experience in software development. Proven track record of designing and implementing VR training simulations, conducting extensive user studies, and leading interdisciplinary teams. Published highly-cited, peer-reviewed research and designed educational courses at a university level. Adept in Unity3D, C#, C/C++, and Python.

💼 PROFESSIONAL EXPERIENCE

2023 | **Postdoc Research Assistant, AARHUS UNIVERSITY, Denmark**
> ❯ Creating rapid prototyping tools for VR/AR concept development by designers.
> ❯ Explored potential of generative AI models (Whisper, GPT-4) in digital prototyping.

Unity3D   AR   AI

2022 | **Visiting Researcher, INRIA RENNES, France**
> ❯ Investigated the use of haptic feedback in enhancing VR based skill training.
> ❯ Created prototype simulations using Haption Virtuous 6D and Geomagic Touch robotic devices.

Unity3D   AR   AI

2023
2020 | **PhD Fellow | Software Engineer, AARHUS UNIVERSITY, Denmark**
> ❯ Developed VR training simulations and conducted studies with more than 300 users.
> ❯ Developed a multiplayer VR game for teaching SCRUM concepts to students at the department.
> ❯ Developed interactive lifelike 3D avatars in VR.
> ❯ Presented research findings at conferences and published highly cited peer-reviewed publications.
> ❯ Designed and taught the "Python for Machine Learning (2021)" course at Aarhus University.

Unity3D   Arduino   Pandas   Scipy   Pingouin   Python   Matplotlib   Scikit-learn

2019
2010 | **Software Engineer | Team lead, AMMACHI LABS, India**
> ❯ Led the Virtual Reality & Serious Games group for three years.
> ❯ Developed 3D training simulation software for clients in the industry and government.
> ❯ Led a team to design and deploy a novel social robot for encouraging handwashing in rural India.
> ❯ Developed a series of board and computer games to introduce programming in rural India.

Unity3D   CHAI3D   Arduino   Android   C++   OpenCV   Puredata   OSC   Microsoft Kinect

🎓 EDUCATION

2020–2023	PhD, Department of Business Development and Technology, Aarhus University
2007–2010	Master in Computer Applications, Amrita School of Engineering, India
2004–2007	BSc in Computer Science, Amrita School of Arts and Sciences, India (3rd Rank)

☰ SKILLS

Programming	C#, C/C++, Python, Java, Javascript
VR/AR	Unity3D, Oculus Interaction SDK, Unity XR Interaction Toolkit, Niantic Lightship
Game Networking	Photon, Normcore
Databases	SQLite, MySQL
IDEs	Visual Studio, Visual Studio Code, Eclipse
Version control	Git
Data Science	Pandas, Scikit-Learn, SciPy, Keras
Haptic Feedback	CHAI3D, Openhaptics

🏅 RECOGNITIONS

> ❯ Best social robot award, IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN) 2019.
> ❯ Awarded Indian patent #422918 titled "A progressive computer simulated haptic training system for bar bending skills".
> ❯ Awarded Indian patent #94860 titled "Balance Monitoring and Training System".

🖥 SELECTED PROJECTS

SCRUM Simulator
2020 - PRESENT

🔗 Link

Developed VR-based multiplayer SCRUM simulator with Unity, Quest SDK, and Normcore networking SDK. Designed initial prototypes and worked with artists and curriculum designers to rapidly iterate and deliver the final product to around 100 students from Aarhus University. Presented work at leading VR conferences.

Unity · C# · Normcore · Photon · Quest SDK · Google Text-to-speech

VR, Haptics and Biosensors for improving industrial skills training
2020 - PRESENT

🔗 Link

Created VR-based skill trainer using Unity, Oculus SDK, Arduino, robotic haptic feedback devices, and iMotions biosensing platform. Measured stress levels, performance, and mental load of hundreds of users. Used Python for data processing, statistics, and, visualisation. Published results in leading VR journals.

Unity · Oculus SDK · Arduino · CHAI3D · C# · C++ · Python

Social robot for promoting hygiene
2018 - 2019

🔗 Link

Led a team of software and mechanical engineers in collaboration with Glasgow University to develop a social robot to encourage children in rural areas to engage in proper handwashing behavior. Developed communication stack for robot control, a custom bluetooth Android library, robot mouth animations in Unity as well as initial physical prototypes of the robot. Won best social robot award at IEEE Ro-Man 2019 conference.

Unity · Arduino · Android · C# · Java

Reinforced bar bending simulator
2014 - 2017

🔗 Link

Led a team of four software engineers and worked with mechatronics engineers to build the reinforced bar bending simulator, currently deployed at five Larsen and Toubro's construction skill training institutes. Documented requirements from expert trainers, developed virtual learning scenarios, virtual learning environment, and real-time mesh deformation graphics. Received Indian patent No. 422918 for this work.

Unity · C# · SQLite

Skill training simulators
2010 - 2015

🔗 Link

Developed simulation software using OpenGL/CHAI3D/Qt for different tools and machinery (drillpress, tablesaw, file, handplane & ratchet) and the APIs for interfacing the simulations with the "APTAH" (linear movement) and "CHAKRA" (rotary movement) haptic feedback devices. Developed a computer vision-based system for simulating a Jigsaw machine with passive haptics.

OpenGL · OpenCV · CHAI3D · Qt · C++

📄 SELECTED PUBLICATIONS

❯ R. Unnikrishnan, Francesco Chinello, and Konstantinos Koumaditis. "Investigating the effectiveness of immersive VR skill training and its link to physiological arousal." Virtual Reality (2022).

❯ R. Unnikrishnan, Konstantinos Koumaditis, and Francesco Chinello. "A Systematic Review of Immersive Virtual Reality for Industrial Skills Training." Behaviour & Information Technology (2021) : 1-30.

❯ R. Unnikrishnan, Amol Deshmukh, Shanker Ramesh, Sooraj K. Babu, A. Parameswari, Rao R. Bhavani. "Design and Perception of a Social Robot to Promote Hand Washing among Children in a Rural Indian School." In the 28th IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). IEEE, October, 2019.

❯ R. Unnikrishnan, N. Amritha, Alexander Muir, and Bhavani Rao. "Of Elephants and Nested Loops : How to Introduce Computing to Youth in Rural India." In Proceedings of the The 15th International Conference on Interaction Design and Children, pp. 137-146. ACM, 2016.