MSc Shivi Vats

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Permit: I hold a Red-White-Red Card Plus, which lets me work in Austria without requiring a new permit.

Work Experiences

University of Klagenfurt **Oct 2022 – Present**
Project Assistant, SPIRIT Project *Klagenfurt, Austria*

- Developed a fully modular subjective testing platform for the HoloLens 2 using MRTK2 with Unity and C#;
- Implemented animated point clouds, eye tracking, UI and UX elements, and HoloLens 2 compatible shaders;
- Organized and conducted subjective testing with 60+ participants;
- Collaborated with project partners and external institutions across Europe to produce five publications.

University of Klagenfurt **Oct 2020 – Oct 2022**
Project Assistant, 5G Playground *Klagenfurt, Austria*

- Worked on the "Virtual Realities" use case, alongside finishing my Masters;
- Developed a Python webapp using Flask and deployed it at a 5G edge using NGINX;
- Ported a viewport prediction algorithm for 360° videos from MATLAB to Python using NumPy and SciPy;
- Modified an Android DASH 360° video client to reduce motion-to-glass latency by up to 62%;
- Wrote my Masters thesis and published one paper on this work.

University of Klagenfurt **Oct 2020 – Jan 2021**
Tutor, Klagenfurt Coding Game Lab *Klagenfurt, Austria*

- Held bi-weekly Twitch streams as the host of the KCGL;
- Taught University students the basics of programming and game development;
- Made a basic 2D platformer in Unity and C#, covering physics, tilemaps, animations, audio, and much more.

Education

University of Klagenfurt - *MSc Game Studies and Engineering* **Oct 2018 – Apr 2022**
AI in Games, AR in Games, Computer Graphics, Virtual Ethics *Klagenfurt, Austria*

- Final Grade: 1.5 out of 4
- Awarded full fee rebate for four semesters (maximum allowed) because of excellent grades

IIIT Una - *BTech Computer Science and Engineering* **Aug 2014 – May 2018**
Data Structures, Object-Oriented Programming, Software Design Patterns *Una, India*

- Final Grade: 7.5 out of 10

Skills

Technical	Experienced with Unity, C#, and MRTK2; Knowledgeable in ARCore, Unreal Engine, C++, Python, and Android; Experienced with developer tools such as Git (GitHub) and various IDEs; Base knowledge of JavaScript, .NET, and React.
Research	I am comfortable translating theoretical research into practical code and applications. I have extensive experience in academic reading, writing, and peer-reviewing. I have created Python webapps, modified Android apps, and written software in Unity for AR HMDs for various research tasks.
Languages	Hindi (native), English (C1), German (B1).

Selected Projects

Subjective Testing Platform	A modular mixed reality testing platform made alone from scratch for HoloLens 2 using Unity and C#. The user-centric design allows researchers to import their own content and configure custom tests. The platform features eye-tracking, anchored UI, HoloLens-centric UX, point cloud playback, and other functionalities.
Vis À Vis	3D first-person horror game developed using UE4 (C++ and BP). As the sole programmer, I designed and implemented the core gameplay systems, including the player controller, inventory management, dynamic trigger interactions, event sequences, and cutscenes.
Car Parkour	3D multiplayer arcade-style racing game developed using Unity and C#. As part of a two-person team, I implemented the multiplayer functionality and some Rocket-League-style mechanics.
SpellSlinger	Augmented reality tower defense game using Unity (C#) and Google ARCore. As the sole programmer on a 3-person team, I built the game's core mechanics, including object spawning triggered by real-world image tags, persistent object management, and the tower defense gameplay loop.

Dissemination and Outreach

Publications

- M. Nguyen, S. Vats, X. Zhou, I. Viola, P. Cesar, C. Timmerer, H. Hellwagner, "*ComPEQ-MR: Compressed Point Cloud Dataset with Eye Tracking and Quality Assessment in Mixed Reality,*" in ACM MMSys 2024;
- M. Nguyen, S. Vats, H. Hellwagner, "*No-Reference Quality of Experience Model for Dynamic Point Clouds in Augmented Reality,*" in ACM MHV 2024;
- M. Nguyen, S. Vats, S. Van Damme, J. Van der Hooft, M. Torres Vega, T. Wauters, F. De Turck, C. Timmerer, H. Hellwagner, "*Characterization of the Quality of Experience and Immersion of Point Cloud Video Sequences through a Subjective Study,*" in IEEE Access 2023 Volume 11;
- S. Vats, M. Nguyen, S. Van Damme, J. van der Hooft, M. Torres Vega, T. Wauters, C. Timmerer, H. Hellwagner, "*A Platform for Subjective Quality Assessment in Mixed Reality Environments,*" in QoMEX 2023;
- M. Nguyen, S. Vats, S. Van Damme, J. van der Hooft, M. Torres Vega, T. Wauters, C. Timmerer, H. Hellwagner, "*Impact of Quality and Distance on the Perception of Point Clouds in Mixed Reality,*" in QoMEX 2023;
- S. Vats, J. Park, K. Nahrstedt, M. Zink, R. Sitaraman, H. Hellwagner, "*Semantic-aware View Prediction for 360-degree Videos at the 5G Edge,*" in IEEE ISM 2022.

Dissemination, Teaching, and Awards

- I taught a 2-hour long lecture to Masters students on 2D game development with Unity and C#;
- I presented a video podcast alongside Assoc. Prof. Dr. Mathias Lux, discussing the pros and cons of Unity vs Unreal Engine;
- I have given 10+ talks and demonstrations between conferences and project dissemination events.
- "Breakup Bonanza" was selected to be showcased at the Austrian Cultural Forum in Warsaw during the "Wrangling Genre Complexity" event in April 2024;
- "Vis À Vis" has over 3k views and almost 1k downloads, and was played by numerous YouTubers;
- My work with 5GPlayground Use Case "Virtual Realities" was nominated for the Futurezone Awards 2022 in the category "5G Innovation des Jahres".

Hobbies

D&D	I am very passionate about TTRPGs, especially D&D 5e. I have run numerous one-shots and a few short campaigns. I am currently running a homebrewed mixture of the Planescape and Eberron settings for a party of 5.
Blog	I like to write about my experiences during development and reflect on them in my portfolio. I also write about hobby projects of mine on my blog.