# 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, Computer Networking*
*Una, India*

- Final Grade: 7.5 out of 10

## Skills

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|---|---|
| Technical | Experienced with Unity, C#, and MRTK2; Knowledgeable in ARCore, Unreal Engine, C++, Python, and Android app dev; Proficient with LaTeX and MS (and Open) Office tools. |
| 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 (A2-B1). |

## Selected Projects

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|---|---|
| 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.