International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 02 | February - 2023 Impact Factor: 7.185 ISSN: 2582-3930

Using Virtual Reality to Improve Student's Job Interview Skills

Tejas Padhiyar [a]
Department of Computer Engineering
SCTR'S Institute of Computer Technology
Kopargaon, Ahmednagar
tejaspad240@gmail.com

Manasi Kamath [b]
Department of Computer Engineering
SCTR'S Institute of Computer Technology
Lonavala, Pune.
manasi.kamath927@gmail.com

Mrudula Jambhalkar [c]
Department of Computer Engineering
SCTR'S Institute of Computer Technology
Kalyan, Thane.
mrudulavj2001@gmail.com

Pranali Navghare [d]
Department of Computer Engineering
SCTR'S Institute of Computer Technology
Dhankawadi, Pune
prnavghare@pict.edu

Geetanjali Kale [e]
Department of Computer Engineering
SCTR'S Institute of Computer Technology
Dhankawadi, Pune.
gvkale@pict.edu

Abstract – **In today's corporate environment, interviews are frequently conducted. They are employed to evaluate candidates' dependability in the particular industry where they hope to find employment. These procedures are frequently laborious and mentally taxing. Most people have a phobia of going to interviews, therefore they usually rehearse by conducting simulated ones. A practice interview teaches you how to respond to challenging questions, develops interviewing techniques, enhances communication, and helps you feel less stressed before the real interview. The seminar aims to provide a digital setting for conducting mock interviews with peers. Through direct engagement with learning objects that replicate in a physical environment, virtual reality experiences will enhance comprehension. Plausibility illusion and embodiment illusion are used in this procedure. In this paper, a virtual setup using a head-mounted display will be demonstrated.**

Keywords: *MetaHuman, Virtual Reality, Unreal Engine, Plausibility illusion, Embodiment illusion.*

1. INTRODUCTION

Naturally, the meanings of "virtual" and "reality" are where the term "virtual reality" originates. Reality is what we as humans experience and the meaning of "virtual" is close to that. So "virtual reality" is essentially just another word for "near-reality." Naturally, this might signify anything, but it typically refers to a certain kind of reality emulation. Through our senses and perception mechanisms, we can understand the world. All of us were taught in school that our five senses are taste, touch, smell, sight, and hearing. However, these are merely our most obvious senses. In actuality, humans possess much more senses than this, such as a sense of balance. We have a rich flow of information from the environment to our minds thanks to these additional sensory inputs and some specialized sensory information processing by our brains. Our

senses are the primary source of information about our world. In other words, our entire perception of reality is just a synthesis of the sensory data we receive and the cognitive processes in our brains that help us make sense of it. So, it seems obvious that if you can trick your senses into receiving false information, your experience of reality will also be affected. You would be given a representation of reality that isn't actually there, but it would appear that way to you, something that we might classify as a virtual reality.

You will master the skills you need to interview clearly and confidently and land your ideal job in this job interview course. Our customers have been successful in finding employment with businesses like Tesla, Google, and the United Nations because of this special combination of online education and virtual reality training. We use VR and online classrooms together to create a distinctive learning strategy. You will be asked to put what you've studied into practice in VR at various times during the course. Just as with any other ability, answering interview questions requires practice to get better. In this course, you can put your newly acquired knowledge to the test and practice responding to interview questions that have really been asked at some of the biggest firms in the world. Online education, virtual reality practice, and immediate discussion feedback are all available [1]. Throughout the course, this feedback loop can help you advance your skills up to four times more quickly. Become less anxious and more confident in the knowledge that you are well-prepared.

In today's corporate environment, interviews are frequently conducted. They are employed to evaluate candidates' dependability in the particular industry where they hope to find employment. These procedures are frequently laborious and mentally taxing [2][1]. Most people have a phobia of going on interviews, so they rehearse by conducting fictitious ones [2][6]. A practice

interview teaches you how to respond to challenging questions, develops interviewing techniques, enhances communication, and helps you feel less stressed before the real interview [1]. The goal of the seminar is to provide a virtual setting appropriate for doing peer-to-peer mock interviews [1]. Through direct involvement with learning materials that reproduce in a physical context, virtual reality experiences will enhance comprehension [1]. The procedure entails using Unreal Engine to put up a virtual area. Additionally, the lecture will offer tips on utilizing Metahuma creator to create characters that will add more authenticity to the interview setting. Implementing the embodiment illusion and plausibility illusion is part of this procedure. This paper will contain a virtual setup demonstration utilizing a head-mounted display (HMD).

You can use the free cloud-streamed MetaHuman Creator program to make your own virtual people in a simple, understandable setting. You can alter your digital avatar's haircut, facial characteristics, height, body proportions, and other attributes using MetaHuman Creator. Unreal Engine is a full set of development tools for games, broadcast and live event production, training and simulation, architectural and automotive visualization, linear film and television content generation, and other real-time applications. By using the metahuman creator the meta character will be created. This metacharacter will be imported into the unreal engine, a virtual simulation room that will be created using the unreal engine.

2. LITERATURE SURVEY

It has been shown that multimedia can offer a very effective teaching and learning environment in a way that takes the learners' preferred learning styles into account [1][2]. Students from two diverse backgrounds received tuition on subjects relevant to fundamental human anatomy using virtual reality multimedia [2]. Each student was questioned once this tutorial was finished and asked for their thoughts. A majority preferred virtual reality [2].

Virtual reality multimedia can even further enhance learning by incorporating more realistic images and visual features [1][2]. This would lead to a situation where the learners could immerse themselves in the environment and 7 dynamically interact with objects and scenarios [1][2]. Very high Weighted Average Indices, t-tests, and interview comments in this study support that virtual reality multimedia is a highly preferred way of teaching and learning and the benefits are transferable between different fields such as business, engineering, and nursing.[2]

A few studies investigated gaze behavior in interview contexts [5]. The authors developed a tool to enable individuals to practice making eye contact during job interviews [5]. If their gaze fell within the virtual character's bounds, the virtual character looked interested in the participant. Otherwise, it moved as if it were not paying attention [5]. While a VR application can provide an opportunity to prepare for job interviews, the eye movements in the background of candidates can also be tracked by accurately measuring gaze to different face regions during different conversational roles like speaking and listening [5]. This allows for identifying differences in the gaze behavior of autistic and neurotypical individuals also [5].

In all stages of the recruitment process, social categorization of job applicants based on ethnicity, skin color, and gender, as well as other forms of discrimination are contemporary issues [4]. Almost 30% of individuals still experience this issue [4]. This study examined the efficacy of using virtual reality technology as part of job interview strategies and evaluated its potential to mitigate personal bias toward job applicants [4]. The use of VR technology in job interviews provides benefits for job applicants in terms of social equity and performance [2][3][4]. The results of this study show that the concept of VR job interviews enjoys a high level of acceptance within the tested demographic of which the majority prefers future interviews to use VR as opposed to traditional face-to-face interviews [4][2].

Virtual interview training systems are based on agents that can assist college students who exhibit a high level of shyness in developing their interviewing abilities and lowering their nervousness before participating in a real interview [6]. Three virtual agents with various personality types, three distinct types of interview preparation materials, and a multidimensional evaluation approach make up the system's three primary contents, which enable it to meet the typical needs of interview preparation [6]. According to user research, the technology can successfully increase the performance of interview training for reserved college students [2][6].

People who are unemployed and close to retirement confront substantial difficulties in seeking new employment [3]. Their lack of psychological preparedness for a job interview may be a contributing factor to this. One of the psychological attitude components, in our opinion, is psychological readiness [3]. It is an active conscious preparedness to interact with a certain component of reality based on prior experience [3]. It involves a person's unique ability to control their

actions and deal with worry [3][2][6]. So, they developed Job Interview Simulation Training (JIST), a computer-based simulator that enables job searchers without employment to frequently practice interviews in a relaxed setting [3].

3. METHODOLOGY

The MetaHuman sample is a whole movie made up of two very realistic digital humans that utilize all of Epic Game's most recent character technology advancements. This sample project offers the first glimpse at MetaHumans, the digital characters produced by the web tool MetaHuman Creator, which allows you to produce the highest-caliber figures.

Using the online MetaHuman Creator tool for Unreal Engine, users may construct high-quality digital characters called MetaHumans. There are downloadable MetaHumans that may be imported directly into Unreal Engine using Quixel Bridge. MetaHumans are much more than a jumble of components thrown into Unreal Engine; they are thoughtfully and carefully developed to streamline the production process and make it possible for creators to start producing content within the engine rapidly.

MetaHumans Blueprint and Their Components

The MetaHumans are made up of many different components, as opposed to the standard UE4 Mannequin character, which is made up of a single Skeleton and Geometry Mesh with a few game-specific components set up in a Blueprint. The body, face, hair, and clothing are made up of these elements.

Figure 1: MetaHuman Creator Interface

MetaHumans and Their Control Rigs

Three-layer groups make up the control rigs powering MetaHumans: Puppet Rigs, Deformation Rigs, and Clothing and Physics.

a) MetaHumans Rigs Layer 1: Puppet Rigs

The Puppet Rigs represent the first layer of our MetaHumans. This is where motions start with the body and face. These rigs are the controls an animator sees and uses.

b) MetaHumans Rigs Layer 2: Deformation Rigs

The **Deformation Rigs** make up the second layer of our Metahumans. This is where a control rig is used to drive all the twist and anatomical joints. This is followed by twelve Pose Driver nodes in the Animation Blueprint, which drives more than one-hundred corrective body poses that help to retain volume and improve the overall deformation of the MetaHuman.
The Face makes use of the RigLogic plugin and executes in a post-processing mode, allowing all cascading changes to pass through Live Link Face or RigLogic expression curves from various animation interfaces and deform the finished face animation.

c) MetaHumans Rigs Layer 3: Clothing and Physics

The final layer is **Clothing and Physics**. This layer is heavily reliant on the MetaHuman's attire, which may include a Control Rig of its own.

Importing and exporting the metahumans in the unreal engine:

Step 1: Install the epic game launcher and Quixel bridge on the system.
Step 2: open epic game launcher and create an account and just sign in.
Step 3: As well as for Quixel Bridge just make sure your sign in on the top right and just click sign in with Epic game launcher.
Step 4: After signing into the epic game launcher go to its libraries and install the latest available version of the Unreal Engine.
Step 5: After installation of the unreal Engine launch Unreal Engine and then just add the required Templates and Canvas and just click virtual Production.
Step 6: In virtual production give the name of the project and just click on create a project.
Step 7: Now open Quixel Bridge and make sure you are logged into your account with Epic game

Launcher at the leftmost panel of the Quixel Bridge click on the Metahumans where Metahuman pre-sets must be only available.
Step 8: Pick any one metahuman preferred in the project and if you want to customize click on start MHC.
Step 9: It will take some time to open the new tab and then metahuman is loaded onto the tab
Step 10: Now you can customize the Metahuman as per certain sets of requirements and save the project.
Step 11: Now we need to navigate the icon so just click on the gear icon, export setting set the export target as unreal Engine, and set the engine version
Step 12: Select Plugin Location, and likely we need to navigate the way through Unreal Engine and then click plugins and click select folder. If you don't have a plugins folder, then create a plugins folder in the build folder.

Unreal Engine is a game development engine developed by Epic Games in 1988 that can be used for creating linear content, and internal and custom projects. It provides tools and features and helps develop programs that allow users to modify and create projects of their own kind. In addition, it has a huge systematic set of tools and editors that help users manage their properties and modify them to create artwork for their projects. A few components of the engine include a graphics engine, online module, physics engine, sound engine, input, and gameplay framework. It contains a number of editors that aid in the game's creation. Unreal Editor is a pre-installed editor through which users can view and interact with other sub-platforms and editors.

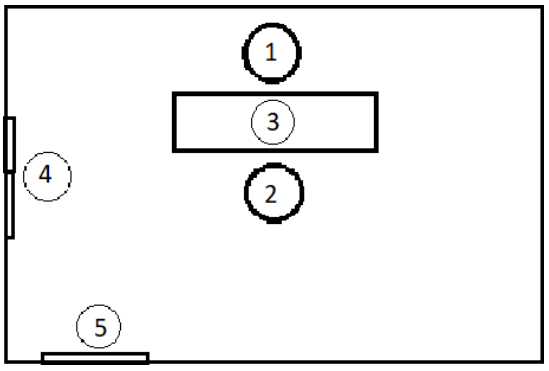

Figure 2: Virtual Environment Room Setup; (1) Interviewer's chair, (2) Interviewee's Chair, (3) Table, (4) Paintings, (5) Door

To make the room appear realistic, several illusions are taken into consideration.

Place illusion (PI) refers to the sense of being in a place in spite of the sure knowledge that you are not there. [7] PI makes sure that the person feels that they have been shifted to a different world. Various factors are taken into consideration while applying place illusion-

The quality of the display is an important factor because the more pixelated the image is, the clearer will be the quality and the illusion will look more realistic. Position and Rotation tracking and position tracking are other important factors that make the users feel as if they are present in the virtual simulation. It gives them degrees of freedom to move or rotate their head. This head movement is tracked using a good tracking mechanism which allows at least 6 degrees of freedom for immersion.

Another important illusion used is the plausibility illusion (Psi) which focuses on building a simulation that appears to be real. According to evidence from numerous experiments, a crucial aspect of psi seems to be that events in the virtual environment that are out of your direct control make direct references to you.[7]

PI and Psi are blended at the participant's body which is the center point. A user will respond to virtual reality as a function of PI and Psi. . As a result, you are inclined to react as though it were genuine. This phenomenon is called as "response-as-if-real" RAIR.[7]

Parallax Mapping is applied in Unreal Engine with the help of "BumpOffset". It is used to give the illusion of depth to the surface without adding extra geometry. It is done by modifying the UV coordinates to displace the texels from the surface of the object. This gives more details to the surface. Lumen is the default global lighting and reflections system in Unreal Engine created for next-generation consoles. In intricate settings, it shows diffuse interreflection with infinite bounces and indirect specular reflections at sizes ranging from millimeters to kilometers.

For optimization, baked lights are mainly used. Stationary lights with "Dynamic Shadows" disabled give better reflexes compared to Static lighting. Thus, it is best to utilize them. A few additional static lights with light intensity are also used for the simulation. Additionally, almost all lights ought to employ light profiles for a better, more realistic fade. This helps in making the simulation as plausible as possible.

4. CONCLUSION

Thus, it concludes that visual features play a very important role in understanding any of the concepts. It is reported that visually rich multimedia can provide very effective teaching.

Mock Interviews basically provide a virtual interaction with the world completely generated by the computer which is the virtual replica of the actual subject. The participants get the feeling as if they are interacting with the real environment and interacting with objects and scenarios in a dynamic manner.

The presence and characteristics of interviewers in a virtual environment can significantly affect the training experience and effect, which has been known as the persona effect.

In recent research papers, they have used unity which is basically used for Game development to develop the VR project but it doesn't make the Virtual environment realistic so there is no real feel for the users. But mock interviews will bring a real feel for the user because this simulation is created in Unreal Engine. Future projects will include the integration of the mock interview project with Machine Learning and Artificial Intelligence which can take decisions on the performance of the student and how he/she has given the interview questions asked by the virtual interviewers and also will provide small feedback on the communication skills of the student.

References

[1] I. Stanica, M. -I. Dascalu, C. N. Bodea and A. D. Bogdan Moldoveanu, *"VR Job Interview Simulator: Where Virtual Reality Meets Artificial Intelligence for Education,"* 2018 Zooming Innovation in Consumer Technologies Conference (ZINC),2018, pp. 9-12, doi: 10.1109/ZINC.2018.8448645.

[2] Nooriafshar, Mehryar & Williams, Ron & Maraseni, Tek. (2004). *The use of virtual reality in education. 6-8.*

[3] Aysina, Rimma & Efremova, Galina & Maksimenko, Zhanna & Nikiforov, Mikhail. (2017). *Using a Computer Simulation to Improve Psychological Readiness for Job Interviewing in Unemployed Individuals of Pre-Retirement Age.* Europe's Journal of Psychology. 13. 251-268. 10.5964/ejop.v13i2.1250.

[4] Beti, Rico & Al-Khatib, Faris & Cook, David. (2019). *The Efficacy of Using Virtual Reality for Job Interviews and Its Effects on Mitigating Discrimination*. 10.1007/978-3-319-93692-5_5.

[5] S. Artiran, R. Ravisankar, S. Luo, L. Chukoskie and P. Cosman, *"Measuring Social Modulation of Gaze in Autism Spectrum Condition With Virtual Reality Interviews,"* in IEEE Transactions on Neural Systems and Rehabilitation Engineering, vol. 30, pp. 2373-2384, 2022, doi: 10.1109/TNSRE.2022.3198933.

[6] X. Jin et al., *"Developing an Agent-based Virtual Interview Training System for College Students with High Shyness Level,"* 2019 IEEE Conference on Virtual Reality and 3D User Interfaces (VR), 2019, pp. 998-999, doi: 10.1109/VR.2019.8797764

[7] Slater, Mel. (2009). *Place Illusion and Plausibility Can Lead to Realistic Behaviour in Immersive Virtual Environments.* Philosophical Transactions of the Royal Society of London. Series B, Biological sciences. 364. 3549-57. 10.1098/rstb.2009.0138.