Sanjit Singh

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I am a highly organized and motivated student of computer science with a passion for technology. I am experienced in AR & VR cross platform applications development (Android, IOS). I have the skills and experience to conceptualize, build, test, and deliver. I am seeking an employment opportunity to increase my knowledge and skills level while contributing to the goals of an organization.

SKILLS

Programming Languages: Java, C#, XML, HTML, CSS, Python, JSON, Swift, JavaScript, C/C++, MATLAB

Hardware: Arduino, Oculus Rift, Oculus Quest, Leap Motion, Microsoft Kinect, Smart Glasses, Microsoft HoloLens

Platforms: Unity3D, Eclipse, Android Studio, Android of Things, Visual Studio, Arduino IDE, Oculus, Jupyter Lab, Jupyter Notebook

Tools/Technologies: Augmented Reality, Virtual Reality, Vuforia, OpenCV, Game Development, Game Design, MRTK, XR Interaction Toolkit

EDUCATION

Rutgers University, New Brunswick, NJ — September 2020 – December 2021

Bachelor of Science in Computer Science

New Jersey Institute of Technology, Newark, NJ — September 2019 – May 2020

Transferred to Rutgers University - New Brunswick.

Mercer County Community College, West Windsor, NJ — Graduated May 2019

Associates of Science in Computer Science
Recognized in school article: http://www.mccc.edu/news/2019/general/Olu_Sanjit_Internships.shtm l

WORK EXPERIENCE

Johns Hopkins University — August 2021 – Present

Research Collaborator

• Working on virtual reality projects using Unity3D for visual field search for patients with glaucoma for identifying identical objects.
• Running data analysis using MATLAB programming language for understanding visual field testing for patients & clinical outcomes
• Utilizing image processing toolbox in MATLAB to understand manipulation of different contrast level & blurs within an image to create a stack of foveated images.

NASA SUITS Augmented Reality Challenge — December 2022 – April 2023

XR Mentor

Served this year to University of Washington, Team Astro huskies as an XR mentor to NASA SUITS challenge of the 2022-2023 year.

Hoth Intelligence August 2022 – December 2022

XR Contractor

• Worked on developing next generation of medical technologies for real-time procedures in skull surgery using Augmented Reality in Unity3D for Microsoft HoloLens 2.

• Utilized Unity's Barracuda Neural Network framework for overlaying accurate face mesh tracking and live streaming that face mesh overlay from the desktop camera application/Azure Kinect DK directly to HoloLens device using Holo-Lights ISAR SDK.

• Worked on improving AR overlay tracking of the catheter through QRcode with Vuforia SDK combined with MRTK deployed onto HoloLens & test out tracking efficiency of catheter overlaid on QRcode images.

• Developed C# scripts for increasing or decreasing the size of catheter approximation through the UI button assets provided by MRTK & QRcode Detection.

UMD Applied Research Lab for Intelligence & Security June 2022 – August 2022

RISC Intern

• Analyzed models of population distribution with Software Instrumentation.

• Installed and configured Apache server through Docker, for Python code to process data.

• Utilized open-source instrumentation libraries, such as Prophet to forecast dataset models using Python in JuptyerLabs.

• Utilized NumPy, PANDAS & Matplotlib libraries to visualize graphs of CSV data files to predict population rates.

• Implemented KMean clustering in Python to sort and classify data.

MIT Jan 2022 – July 2022

Catalyst Fellow

• Was the very first undergraduate student accepted into this fellowship.

• Catalyst brings together multidisciplinary experts to work together in an iterative process to identify and validate unmet medical and health-related needs, discover new project opportunities, and develop action plans.

• My team and I proposed an unmet need for stroke rehabilitation for the upper arm extremity where we presented our idea to faculty every week with backed-up research evidence on the upper arm extremity is still a problem for handicapped patients.

• Participated in stakeholders & customer discovery interviews to further understand problems with stroke conditions.

NASA @ Johnson Space Center Jan 2022 – May 2022

S.U.I.T.S Intern

• Supported the continued development of technical challenges for future activity cycles & the development of future K-12 SUITS component activity challenges

• Supported an efficient promotional campaign, including social media and traditional method

• Assisted with the day-to-day tasks of the NASA SUITS challenge

• Long-term goal is to have a marked increase in the efficiency and productivity of the S.U.I.T.S. project and OSTEM priorities. S.U.I.T.S. program also involves incorporating the Microsoft HoloLens & Magic Leap device within the Unity game engine on experimenting with technical designs and challenges to assure no issues in technical development occur and documenting any problem that was to occur when developing, testing & deploying HUD into HoloLens or Magic Leap devices.

MPLEX August 2021 – Jan 2022

Mixed Reality Developer

- Worked on AR Spectator app features that allow users to replay gameplay events in real time
- Modified bugs & features for app such as collision, laser hit detection, main menu options & UI in Unity3D • Contributed to Epic Game Mega Grant proposal on more about product & games being developed, estimated budget & grants company is seeking and doing revisions to make sure all information on grant application is accurate
- Integrated Twitch API into Unity for live chat streaming through the AR app

Rutgers University @ Computational Biomedicine Imaging and Modeling Center August 2021 – Dec 2021

Research Assistant @ The Intelligent Visual Interface Laboratory

Conducted Computer Graphics & AI research on Developing AI models for multi-agent soccer simulation using Unity3D.

The University of Auckland May 2021 – September 2021

Research Intern @ Empathic Computing Lab

• Conducted research on Eye-gaze, inter-brain synchrony (hyper scanning), and collaborative virtual reality in conjunction with online counseling, during the COVID-19 period
• Worked on data & EEG analysis using Python. Utilized HyPyP and MNE for brain hyper scanning and communication interactions between users.
• Used SciPy library to calculate average data of eye-tracking for x and y coordinate and then computing average result into a correlation using Kendall tau function (method built into Scipy)
• Eye gazing analysis using NumPy & Pandas Library. Analyzing the degree of eye contact through Fovea, to better understand interpersonal communication in the virtual landscape vs in the real world.
• Successful completion of Python analysis regarding brain synchronization and eye gaze communication, to better understand interpersonal communication relationships and emotions.
Then successfully developed realistic virtual worlds to better understand brain hyper scanning and interpersonal communication through VR.

National Security Innovation Network June 2021 – August 2021

X-Force Fellow – Software Engineering Intern

- Utilized storyboarding techniques to showcase future technologies in a video/VR format.
- Designed scenarios for warfighter jet training, combat simulation training, and for planning out future battle strategies using Unreal Engine 4.
- Worked on blueprint scripting language in unreal on virtual characters, HUD, and AI agents.
- Goal is to support the assertion that money should be invested into different storytelling tools rather than staying in the past and using PowerPoint. In addition, this project has other application use as well such as helping soldiers in planning situations, training through wargaming concepts, and more.
- Work done towards the project; all intellectual property is owned by participants. The next goals are too commercial this product by forming a startup and applying through the NSIN program known as Vector.

NASA SUITS Augmented Reality Challenge September 2020 – May 2021

Project Team Leader

• Participated in NASA SUITS Augmented Reality challenge where my university (Rutgers) was one of the top 20 teams selected to develop AR systems for HoloLens 2 to help astronauts go on lunar exploration by 2024.
• Utilizing Microsoft Mixed Reality Toolkit (MRTK) to develop UI Components and gesture recognition features along with voice commands for Heads Up Display (HUD)

• Implemented telemetry streaming (space vitals) using Postman API, Unity JSON package along with web request server to read out telemetry data, parse & structure individually into UI text element to display vitals.
• Developed geology sampling documentation UI for astronauts to have an accurate idea of what to collect as they navigate the moon.
• Currently working on implementing a navigation component that can help astronauts plan out wayfinding points from one location to another.
• Long-term goal is to publish a paper at a research conference. More Progress on a project coming soon!
• Project is now being developed by students from the University of Washington Reality Lab where we will be applying to the NASA SUITS challenge this upcoming year (2022-2023).

XBoost

Co-founder & Vice President February 2020 – April 2021

Early-stage biotechnology startup funded by National Science Foundation Innovation-Corps (I-Corps) program.

Managed a cross-disciplined team of computer scientists, software engineers, hardware engineers, mechanical & biomedical engineers, designers & medical clinicians.

Worked on developing rehabilitative assistive robotic exoskeleton devices and VR/AR Interactive environment for patients with strokes, musculoskeletal conditions, orthopedic rehabilitation & more.

The startup was expected to bring in pending collaboration with Mount Sinai Hospital & the University of Pennsylvania Robotics Rehabilitation Lab.

Due to COVID-19, XBoost was unable to secure funds.

New Jersey Institute of Technology August 2019 – September 2020

Research Assistant @ Biodynamics & MIXR Lab

Biodynamics Lab

- Conducted research in the Department of Biomedical Engineering towards Virtual Rehabilitation Therapy
- Utilized Arduino Micro-controller, IMU sensors and myoware sensor devices all towards robotic exoskeleton arm for neurological patients with Cerebral Palsy that require neuromuscular support.
- Interfaced robotic arm through Arduino to Unity3D to serve as a wearable controller for video games.

The Biodynamics Lab was selected by NSF I-Corps program with a funding of $2,000 to conduct research & development that could be potentially commercialized into a startup that develops core technologies, robotic. devices & interactive games for therapeutic clinics. Taking all the work conducted in the research lab to XBoost.

MIXR Lab August 2019 – January 2020

- Conducted research in the Department of Computer Science & Informatics towards military medicine.
- Utilized Machine Learning & Computer Vision Library into Unity3D to detect accurate pose estimation.
- Utilized Azure Kinect DK for motion tracking, calculating body joints, 3D mesh scanning and point cloud visualizations.
- Goal was establishing a tool for Microsoft HoloLens 2 that can help paramedics & surgeons treat Injured soldiers shot on the ground-based off accurate pose position, mesh scanning through point cloud visualizations and overlaying holographic projection of 3D human muscle skeleton model onto a human body of injured soldier.

Enable Games / Drexel University Spin off startup@ Replay Laboratory May 2018 – June 2020

Game Developer & Researcher

- Developed projects using Unity3D to enhance physical therapy for patients who have Cerebral Palsy, Parkinson's, and other neurological conditions.
- Built custom asset library to integrate the use of Xbox Kinect to enable motion tracking in the use of physical therapy activities.
- Implemented use of Stykz, a motion capture studio software to take real life motions and turn them into animations into games and further exporting all movements and motion tracking input into RAW data using JSON.
- Reviewed roles in clinical trials for usability purposes with patients. Analyzing inputs and gathering more clinical data between interaction of the patients through the games and recording their progress through our platform.

Weill Cornell Medicine / Cornell Medical School April 2019 – June 2019

Research Assistant

- Worked in engineering sub-team researching the integration between 3D segmented heart models derived from CAT scans and fluoroscopic images.
- Utilizing 3D models & AR Visualizations to minimize error on syncing both CAT scans and fluoroscopic images for catheter approximation during cardiovascular Interventions.
- Worked on improving thickening of blood volume of 3D Segmented CAD Models using Rhino 3D & Geomagic Wrap to test into Microsoft HoloLens for visualizing detection of catheter accuracy to better assist Interventional cardiologist.

HACKATHON PROJECTS

OperatAR Dec 2017 - Present

An app that teaches users how to perform surgery and how to give clear directions in an operation room through Augmented Reality. The app was built using Unity3D, C#, Vuforia and Android Studio integrated through Google Cloud using speech to text API.

CelebralPalsyVR Nov 2017 – Nov 2017

A series of VR-based games that help rehabilitate cerebral palsy patients who are partially able to move their feet and/or hands. The patient uses an Oculus Rift headset with Arduino sensors attached to their legs and hands. I worked extensively on the implementation of the main menu, UI, VR input. Also helped develop certain movements that our VR game could use to help cerebral palsy patients. Worked on backend with Android Studio to use the gyroscope tool for our balance measurements with mobile Android devices serving as the sensors of physical motion.

AWARDS/HONOR

MIT LinQ Catalyst Fellowship MIT linQ Fall 2021

Selected as a Catalyst fellow for the 2022 cohort. Catalyst brings together multidisciplinary experts to work together in an iterative process to identify and validate unmet medical and health-related needs, discover new project opportunities, and develop action plans.

Amazon Web Services - Best Use of AWS HackRU Fall 2017

Developed a machine learning program that can diagnose Diabetes based on the information that patients provide to Amazon Alexa through a series of questions.

Top 30 Hack PennApps Fall 2018

Developed a social media app using Facial Recognition to help others get to know each person faster. The app scans their face and through the datasets display their name and stores the exact day, time, and location where they met.

NSF I-Corps Grant Recipient National Science Foundation Innovation Corps Spring 2020

$2,000 grant awarded to "teams interested in exploring the commercial viability of their ideas for products and businesses that are based on their own inventions.

MIT COVID-19 Challenge Winner MIT COVID-19 Challenge Spring 2020

Came up with a program that can-do questionnaire testing and then based on answers get a sample test kit sent home. Once that test kit is sent back to clinical labs, they can use Machine Learning Algorithms to conduct antibody testing to accurately diagnose if the patient has Coronavirus or not.

Publications

Eye-Gaze, Inter-Brain Synchrony, and Collaborative VR in Conjunction with online Counselling: A Pilot Study
Ihshan Gumilar, Amit Barde, Ashkan F. Hayat, Mark Billinghurst, & Sanjit Singh

Inter-brain Synchrony and Eye Gaze Direction During Collaboration in VR
Ihshan Gumilar, Amit Barde, Prasanth Sasikumar, Mark Billinghurst, Ashkan F. Hayati, Gun Lee, Yuda Munarko, Sanjit Singh, Abdul Momin