Shubham Singh
London, UK
s.nfynt@gmail.com

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SUMMARY

I am enthusiastic about research and development with latest technologies, especially with mixed reality and computer vision. I have experience in building cross platform multiplayer application with enterprise standards, leveraging latest development in the field of VR/AR using Unity and computer vision.

EDUCATION & CERTIFICATION

University College London (UCL), London Sep'19-Sep'20
Master of Research (MRes) in Virtual Reality
CGPA - pursuing

Rajiv Gandhi Prodyogiki Vishwavidyalaya, Bhopal Jul'12-Jun'16
Bachelor of Engineering in Information Technology
CGPA – 7.33/10

Computer Vision with OpenCV and Deep Learning Dec'19
MOOC on Udemy [Certificate]

Computer Vision and Image Analysis Dec'18
Microsoft course on edx.org [Certificate]

SKILLS

Languages: C#, C++, python, JS, MATLAB and CG.

Industry Knowledge: Virtual and Augmented Reality, Computer Graphics, Computer Vision, SLAM systems, Differential Geometry, Game Development and Computer Networking.

Tools/SDK/API: Unity3D, OpenCV, WebGL, ARCore, Leap motion, Oculus, Vive, Vive SRanipal, Unity ECS, SFML, Boost, libigl, g2o, ceres, DBoW2, WebRTC, Kinect, Keras, nodeJS, Android Studio, FFMPEG, Photon Unity Networking, Mapbox, Git, Azure compute, and Azure cognitive services API.

PROJECTS

- Fusion of GNSS and visual SLAM for geo-referenced positioning and heading of a mobile user for Augmented Reality. For my dissertation – I am currently working on extending openvslam project and fusing calibrated GNSS into local Bundle adjustment optimization.
- Smart city project: used VSLAM to reinforce GPS tracking for real-time cross-platform collaboration in mixed reality application, supporting features like - virtual guides, free hand drawing, voice conferencing, and loading runtime contents. [Demo]
- 3D Mesh alignment/registration using ICP point-to-point and point-to-plane methods. [Demo]
- WebGL rendering using Path tracing: physically corrected Phong shading with BRDF and Quasi Monte Carlo approach using Halton sequence. [Demo]
- Mixed reality project for Escape room experience – using Vive Pro for VR, Leap motion for hand tracking, vive trackers for props with room scale mapping and haptic feedback. [Demo]
- Inverse kinematic with temporal and permanent constraints: Extended novel FABRIK implementation for solving IK for articulated bodies of varying length and implemented temporal constraint of angular velocity and permanent constraint of swing and twist for every joint. [Project]

EXPERIENCE

Summer Research Intern Jun'20 - present

Research Centre on Interactive media, Smart systems and Emerging Technologies (RISE) LTD, Cyprus

- Working on a mixed reality based collaborative application for AR and VR users, that facilitates real time collaboration and dynamic experiences on a geographical scale (loosely coupled GPS + VSLAM for geo-referenced localization).
- Exploring on possible use cases and integration of real-time IoT data and interactive user experiences within the platform.

Staff Engineer Sep'17 – Jun'19

Imaginate Software Pvt. Ltd. Hyderabad

- Awarded as best person in Technology for year 2018.
- Worked in the core product team and took the responsibility for the architecture and development of the product (Assist - AR based cross-platform review and collaboration). It is being used by clients such as – UTC, Ford, ABB and others. I also did R&D for core features improving video streaming latency and bandwidth requirement, feature tracking on livestream, screen sharing, etc.
- Lead the VR collaboration project for a team of petro-scientists at Shell PLC. I was incharge for an end-to-end delivery of the 6 months long project, where I captured the requirements and coordinated between client and internal team for development and delivery. I took care of the project R&D and features, such as – pipeline to import CT-scanned images, fluid simulation, and plant safety maintenance (explosion simulation and integration of records from cloud).
- Developed feature for capturing 3D VR sessions, which records all actions, events, conversation (audio), and contents of the session. These recordings can then be replayed in offline mode and shared with others for reviewing purposes.
- Written platform (Win & android) native libraries to render out office documents files (i.e. DOCX and XLSX) and PDF inside VR application in real time.
- Created android native plugins for detecting and controlling UVC compliant camera over OTG port.

Lead Software Imagineer Nov'16-Aug'17

XR Labs Pvt. Ltd. Chennai

- Developed interactive visualization app for pattern and color painting on physical wall. Used OpenCV for image segmentation and watershed algorithm to extract wall mask, and Unity3D for visualization and integration of leap motion for user interaction. The application was deployed on intel NUC unit and used in public stores.
- Developed immersive VR-experience of endangered wildlife species on HTC Vive using Unreal engine. The application was installed at Abu Dhabi Terminal 1 called virtual safari.
- Worked on multiple VR and AR projects for training, repair and inspection of mechanical machinery such as engine valve adjustment, servicing of tractor, electric scooter etc.
- Worked on marker-less tracking, annotations and virtual meeting space – multi-user experience with VR collaboration.
- Written a custom parser for exporting and loading of 3D CAD files in Unity at runtime.

Game Programmer Internship Jan'16 – Nov'16

All in a days play Pvt. Ltd. Mumbai

- Prototyped and developed VR simulation game for wing suit diving, targeted for mobile VR

cardboard devices.

- Created a 2D arcade game “Future Ride” inspired from rocket league. The game was targeted for local multiplayer category and was selected among top 10 games at Pocket Gamer Connect, Bangalore 2016.
- Prototyped and developed multiple games in varying genres – simulation, puzzles, and mobile trivia.

ACHIEVEMENTS AND HONORS

Achievements

- Microsoft azure ninja cat badge in week of AI 2019. [Follow]
- My game was selected among top 10 games among 100s of other at Pocket Gamer Connect Bangalore 2016.
- Qualified for ACM-ICPC Asia regional consecutively 3 years, ranking under 200 among more than 1500 teams.
- Won 2nd prize in reverse engineering at Techwizard, 2013.
- Secured 2nd position in college level quiz on World environment day, 2014.

Extra-curricular Activities

- Director of Hackathons as part of UCL Tech Society 2019-20.
- Delivered guest talk at UXIndia 2017 Bangalore on following topic “Platform agnostic UX/UI for AR/VR application”. [Follow]
- Given workshop on augmented reality (AR) application organised by Apple Developer group (ADG) at Vellore Institute of Technology (VIT), Chennai 2017. [Follow]
- President of the RJITGEEK coding community under Codechef campus chapter (2015-16).