Himanshu Pahadia

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Education

Indraprastha Institute of Information Technology, Delhi

New Delhi, India

Bachelor of Technology in Computer Science and Engineering

Aug 2014 - Jun 2018

- CGPA: 7.47/10.0; Coursework: Image Analysis, Computer Graphics, Mobile Computing, Virtual Reality, Designing Human-centered systems, Data Structures and Algorithms, Database Management, Operating Systems, Linear Algebra

Experience

Hitachi Vantara

Pune, India

Consultant (Role - Data Scientist)

Sep 2019 - Present

- Member of the AI team in Insights and Analytics COP. Developing solutions in Deep Learning, Computer Vision, and Extended Reality.
- Team Lead for Bengalathon 2019 (Nation-wide Hackathon organized by West Bengal Gov.) participating team - "Road Runners". Designed and developed a solution - Smart Roads - aimed to improve road safety using computer vision and provide intelligent analytics for the government. **The team stood second among 2500+ participants.**
- Lead architect for Virtual Experience Platform which aims to provide an end-to-end solution for immersive training creation, training assignment and analytics. **Won HiLife award for outstanding performance in the project.**
- Worked on ExtractAI - comprehensive entities extraction tool that extracts entities from documents like forms, receipts, invoices, etc. Designed and developed the following modules - image preprocessing pipeline, entity-extraction module based on spatial proximity, contextual OCR correction, complex entity extraction, table extraction, and validation.
- Lead architect for Hitachi's XR Suite - platform with six XR applications for the manufacturing industry. Responsible to design the solution architectures along with the technology stack and estimate efforts to develop the platform.

Zenlabs (AI Research lab), Zensar Technologies

Pune, India

Associate Innovation Engineer

Jun 2018 - Aug 2019

- Member of Smart Iye team (Computer vision, augmented reality, virtual reality) at the Zenlabs, research and innovation center of Zensar Technologies. **Filed two patents in the computer vision domain. One more in the filing stage.**
- Designed, developed, delivered a smart visual analytics system that enabled real-time person tracking, person re-identification, emotion recognition, age, and gender prediction. Analytics dashboard aimed to provide intelligent insights.
- Researched on bias created in age prediction models by the expressions/emotions of people in the dataset. Implemented a bias reduction matrix algorithm (based on age-group and expression) that improved the accuracy of the model in a commercial product.
- Worked on CTO-led self-driving golf cart project. Designed and developed the electromechanical components of the golf cart, allowing the computer to control steering, acceleration, and braking mechanism. Solved slope braking problem using a custom algorithm. Worked on the lane detection and steering angle prediction CNNs. **Received Team Eureka award for innovative solution.**
- Improved the hand gesture recognition framework from internship by adding new gestures (using a manually collected dataset) and optimizing the image preprocessing pipeline. Framework allowed MacOS users to control mouse - click, scroll, drag.

Research and Development Intern

May 2017 - Jun 2017

- **Received pre-placement offer.** Designed and developed a hand gesture recognition framework using deep neural network and multi-threaded execution allowing real-time recognition. Integrated it with a retail catalog developed using Django and MongoDB.
- Developed a virtual reality walkthrough application of Zenlabs using Oculus Go. Designed realistic textured objects using Blender. Enabled various human-centered interactions for a handheld controller.

Virtual Campus Project, IIIT Delhi (Prof. Ojaswa Sharma)

Delhi, India

Research Intern

May 2015 - Jul 2015

- Virtual Campus Project is a 3D interactive and immersive virtual/mixed reality environment of IIIT Delhi designed to support smart navigation and telepresence.
- Researched means of realistic terrain creation using contour maps. Designed the terrain, heightmaps, and textures on CryEngine with accurate scale, elevation, and slope while still maintaining performance. Developed the project's showcase website.

Patents

A system and method for performing tasks based on multi-modal hand gesture recognition

Patent app no. - 201821049794

The patent proposes a novel system to capture the high-frequency vibrations produced as a result of muscle traction and visual feed to recognize and classify the hand gestures. It uses an ensemble neural network and performs tasks based on micro or macro-gestures.

An unmanned aerial vehicle and a method thereof

Patent app no. - 201921023696

The patent proposes an architecture of a surveillance drone that is equipped with multiple environment mapping sensors. The drone follows the person and keeps track of any suspicious activity happening around the user using CNN/RNN.

Smart Mixed Reality headset with egocentric vision capture and a method thereof

Filing in progress

The patent proposes an architecture of a mixed reality headset with an egocentric camera that captures user's daily activity which is later utilized to realize personal well-being, health/fitness tracking, and personal safety.

Academic Projects

Interactive Swept Surface Modeling in Virtual Reality *Undergraduate Project*

Advisor: Prof. Ojaswa Sharma

- An interactive VR application that allows the user to sweep surfaces in a virtual environment using both motion-tracked controllers. It is an implementation of a paper by Tim McGraw, Esteban Garcia, and Drew Summer (Purdue University)

Project Lazy Pizza *Undergraduate Project*

Advisor: Prof. Ponnurangam Kumaraguru

- Designed a platform that crowdsources the food delivery system within the IIIT Delhi campus by implementing a barter system and virtual currency. Designed and developed the android application after following UX practices.

Depixelize Pixel art *Undergraduate Project*

Advisor: Prof. Ojaswa Sharma

- Implemented an algorithm that interprets each pixel of the pixel art and convert them into regions that can be drawn using piecewise-smooth curves. It is an implementation of a paper by Johannes Kopf and Dani Lischinski.

Safety first *Undergraduate Project*

Advisor: Prof. Pushpendra Singh

- An android application that aims to provide safety while driving. It predicts using ML models whether the person is driving using a trained model on collected accelerometer data, and takes action on whether to mute incoming notifications.

Skills

Area of Expertise	Computer Vision, Deep Learning, Augmented Reality, Virtual Reality, Machine Learning, Artificial Intelligence
Programming Languages	Python, C/C++, C#, Java, JavaScript, Blueprint visual scripting
Libraries & Frameworks	TensorFlow, Keras, PyTorch, TensorFlow Lite, OpenCV, Scikit, NumPy, Unity3D, Android, Unity3D, Django, Arduino, Facebook Prophet, Unreal Engine 4, Oculus SDK, ROS, Git, Blender, MongoDB, MySQL, Adobe Photoshop, Adobe Illustrator, MATLAB, Octave, LaTex

Honors & Awards

1. **Second Rank,** Bengalathon 2019 - We showcased our solution "Smart Road" project which aimed to improve road safety and reduce fatalities due to road accidents. The project was approached by IT Department, Govt. of Bengal to be implemented in the smart city - New town, West Bengal. *2019*
2. **HiLife award,** Hitachi Vantara - For outstanding performance and contribution towards an XR solution. *2020*
3. **Team Eureka,** Zensar's Corp Dev Awards FY 2018-19 - Self-driving golf cart team received for innovative solution. *2019*

Positions of Resposiblity & Volunteering

1. **Teacher (Volunteer),** Health Fitness Trust (NGO) - Minority group skill enhancement project *2017*
2. **Organizing Lead,** ZenXpo'19 (Zenlabs' Research showcase) *2019*
3. **Club Coordinator,** Ink. (Design club) *2015 - 2017*
4. **Head, Design team,** Media Panel (provides official content to IIIT Delhi) *2015 - 2017*
5. **Teaching Assistant,** UX design winter school'17 *2017*
6. **Creatives Head, Organizing committee,** Odyssey (Cultural fest) and Esya (Technical fest) *2016-2018*
7. **Event head,** Design 360 - IIITD's first designathon *2017*
8. **Design head,** TEDxIIITD'16 *2016*