Bharat Vyas

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Profile

Recent PhD graduate in Computer Science & Statistics, with research focus on the intersection of Virtual Humans, Virtual Reality, and Applied Perception. With a robust background in research and collaborative projects, I am eager to bring my expertise to dynamic and innovative team environments.

Research Experience

October 2024 – present
Dublin, Ireland

Trinity College Dublin, Postdoctoral Researcher

- Evaluating empathic responses to expressive virtual humans using eye-tracking and facial-EMG.
- Developing models for full-body motion reconstruction from sparse data inputs.
- Applying LSTM and Transformer models for motion style classification and reconstruction.

October 2023 – March 2024
Tübingen, Germany

Amazon Development Center Germany GmbH, Applied Science Intern

- Collaborated on VR based Human-Computer Interaction project, leading experiment design, data collection, and analysis for future VR applications.
- Managed data collection and analyzed motion/qualitative data, deriving insights.
- Presented two POCs at "Innovation Days" hackathons.

March 2022 – May 2022
Rennes, France

INRIA, Rennes, Research Intern

Supervisor: Prof. Ludovic Hoyet, Prof. Julien Pettre

- Collaborated with the VirtUs team to explore GPU-accelerated Isaac Gym for rapid policy training and crowd generation of physics-based characters.
- Conducted research on the relationship between motion and body shape in virtual humans.
- Investigated factors influencing user perception of virtual human motion, with a focus on walking animations.

June 2021 – August 2021
Tübingen, Germany

Max Planck Institute of Intelligent Systems, Research Intern

Supervisor: Prof. Michael Black

- Investigated the application of Deep Reinforcement Learning (DRL) techniques for animating physics-based virtual characters.
- Utilized the SMPL body model alongside regression-based capsulization methods to create diverse character models.
- Implemented mass effect simulation to introduce significant variations in character motion, enhancing realism and diversity.

Tools & Frameworks

- **ML frameworks**
  TensorFlow, PyTorch
- **3D Game Engine**
  Unity 3D
- **Packages & Tools**
  NumPy, Scikit-Learn, Pandas, Jupyter Notebook, AWS SageMaker, EC2, S3
- **Motion Capture System**
  Vicon, Xsens, Noitom

Professional Experience

May 2019 – July 2019 — **Entercres Labs Pvt. Ltd,** Robotics Trainer & Developer

October 2018 – April 2019 — **Grainpad Pvt. Ltd.,** Robotics Engineer

August 2018 – September 2018 — **Grainpad Pvt. Ltd.,** Mechatronics Intern

Education

2020 – 2024
Dublin, Ireland

Ph.D. in Computer Science, Trinity College Dublin

Supervisor: Carol O'Sullivan
Topic: Investigating Motion Perception and Physics-based Methods for Body Shape Diversity in Virtual Avatars
CLIPE Project- Marie Skłodowska-Curie Actions ITN European Project

2019 – 2020
Dublin, Ireland

M.Sc. in Computer Science (Virtual & Augmented Reality),
Trinity College Dublin

2014 – 2018
Delhi, India

Bachelor of Technology (Mechanical & Automation Engineering),
GGS Indraprastha University

Publications

Exploring the Perception of Center of Mass changes for VR Avatars, Bharat Vyas, Ludovic Hoyet, Carol O'Sullivan. ICAT-EGVE 2023 - International Conference on Artificial Reality and Telexistence & Eurographics Symposium on Virtual Environments, Dec 2023, Dublin

Best Paper Award

ShapeVerse: Physics-based Characters with Varied Body Shapes,
Bharat Vyas, Carol O'Sullivan. Eurographics 2024 Poster Papers, Apr 2024, Cyprus

Shape Shifters: Does Body Shape Change the Perception of Small-Scale Crowd Motions?, Bharat Vyas, Carol O'Sullivan - arXiv preprint arXiv:2412.16151, IEEEVR VHCIE workshop 2025, France

Programming Skills

C++		Python	
C#		R Programming	
GLSL			

Teaching Work

Computer Graphics - CS7GV6 (2020, 2021, 2022)

Real-Time Rendering - CS7GV3 (2021)

Real-Time Animation - CS7GV5 (2021)

Computer Engineering - CSU11E03 (2023)

References

1.) Betty J. Mohler

Principal Applied Scientist
Amazon Development Center GmbH
Tübingen
Germany

Email: btmohler@amazon.de

2.) Ludovic Hoyet

Chargé de Recherche INRIA
(Full-time INRIA Researcher)
INRIA, Rennes
France

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