Bharat Vyas

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Profile

Recent PhD graduate in Computer Science & Statistics, with a strong background in machine learning. 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
	<u>Supervisor:</u> Carol O'Sullivan
	<u>Topic:</u> 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
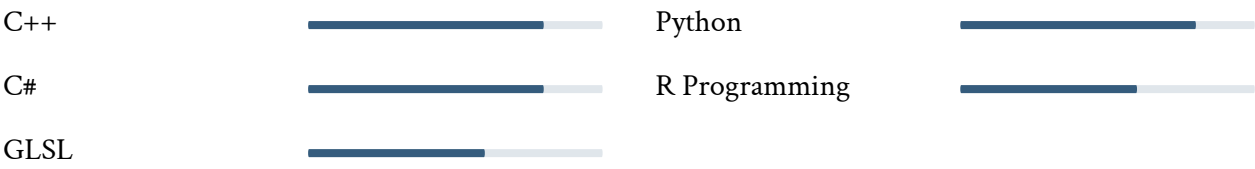
Teaching Work

Computer Graphics - CS7GV6 (2020, 2021, 2022) 🔗

Real-Time Rendering - CS7GV3 (2021) 🔗

Real-Time Animation - CS7GV5 (2021) 🔗

Computer Engineering - CSU11E03 (2023) 🔗