Bharat Vyas

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Profile

As a PhD candidate specializing in Virtual Reality (VR) and Animation, I'm nearing the completion of my studies. With a solid background in research and collaborative projects, I'm eagerly seeking opportunities to channel my expertise within dynamic and innovative team settings.

Research Experience

October 2023 – March 2024
Tübingen, Germany

Amazon Development Center Germany GmbH, Applied Science Intern

- Collaborated on VR/Self-Avatar HCI project, leading experiment design, data collection, and analysis for future VR applications.
- Contributed to project research/design, and developed experimental methodology.
- Managed data collection and analyzed motion/qualitative data, deriving insights.
- Presented POCs at "Innovation Days" hackathons, one idea integrated into production.

March 2022 – May 2022
Rennes, France

INRIA, Rennes, Research Intern

Supervisor: Prof. Ludovic Hoyet, Prof. Julien Pettre

- Worked with the VirtUs team to explore GPU-accelerated Isaac Gym for quick policy training and crowd generation of physics-based characters.
- Collaborated on research investigating the relationship between motion and body shape of virtual humans.
- Explored various factors influencing the user perception of virtual human motion (in particular walking animation).

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 techniques for animating physics-based virtual characters.
- Utilized the SMPL body model alongside regression-based capsulization methods to create a spectrum of character models.
- Implemented mass effect simulation to introduce significant variations in character motion, enhancing realism and diversity.

Professional Experience

May 2019 – July 2019

Entercres Labs Pvt. Ltd, Robotics Trainer & Developer

Responsibilities Included:

- Development of Arduino-based Block Programming application, contributing to open-source projects like ARDUBLOCK and Google's Blockly.
- Conducting Robotics workshops across diverse laboratories and centers.
- Leading the design and development of innovative robotics learning kits.

October 2018 – April 2019

Grainpad Pvt. Ltd., Robotics Engineer

Responsibilities Included:

- Leading the development of prototype 3D models to advance autonomous navigation robot.
- Conducting training and testing of navigation algorithms in the Gazebo simulator.
- Handling sensor data reading and processing for SLAM operations.

August 2018 – September 2018

Grainpad Pvt. Ltd., Mechatronics Intern

Responsibilities Included:

- Utilizing the ROS platform with Python API for machine control.
- Integrating sensors such as cameras, LiDAR, and ultrasonic sensors into the existing ROS framework.

Education

2020 – present
Dublin, Ireland

PhD in Computer Science, Trinity College Dublin

Supervisor: Prof. Carol O'Sullivan
Topic: Variation in Virtual Human Motion Based on Body Shape
CLIPE - Marie Skłodowska-Curie Actions ITN European Project
Planned Submission: *30th August 2024*

2019 – 2020
Dublin, Ireland

MSc in Computer Science (Virtual & Augmented Reality),
Trinity College Dublin

2014 – 2018
Delhi, India

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

Programming Skills

C++		Python	
C#		R Programming	
GLSL		MATLAB	

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

Teaching Work

Computer Graphics - CS7GV6 (2020, 2021, 2022)

Postgraduate Module (Semester 1): An introduction to Computer Graphics and OpenGL.

Real-Time Rendering - CS7GV3 (2021)

Postgraduate Module (Semester 2): Overview of graphics pipeline; Introduction to GPUs; Introduction to shader programming using GLSL.

Real-Time Animation - CS7GV5 (2021)

Postgraduate Module (Semester 2): An overview of fundamentals on real-time animation techniques; Motion capture systems; Animation data representations; Behavioural Animation; and Facial Animation.

Computer Engineering - CSU11E03 (2023)

Undergraduate Module (Year 1): Introduction to programming - C++; Programme design process, algorithms, and pseudocode.

Selected Academic Projects

2020

Real-Time Physics based Character Control Carrying Different Loads,
MSc Thesis Project

- Applied inverse dynamics principles to achieve comprehensive full-body control of virtual characters.
- Employed body joints as actuators to simulate torque effects and virtual forces during load-lifting scenarios.
- Implemented real-time motion synthesis to enhance the natural behavior and interaction of characters.

2018

Robotic Exoskeleton Arm using Pneumatic Artificial Muscles,
Engineering Final Year Project

- Developed a lightweight portable exoskeleton arm tailored for rehabilitation applications.
- Implemented Pneumatic Artificial Muscles (PAMs) as actuators for arm motion, optimizing them for cost-effectiveness and reduced weight.
- Integrated muscle sensors for automation, with Arduino Uno utilized to manage feedback signals.