

## Professional Experience

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### Adobe Inc.

Research Scientist

September 2022 – Present

San Jose, CA, USA

- › Working with the Real-Time Algorithms team on video processing problems.

### Google Inc.

Research Intern

May 2022 – August 2022

Mountain View, CA, USA

- › Worked on facial expression synthesis.

### Adobe Inc.

Research Intern (Remote Internship from College Park, MD, USA)

May 2020 – March 2021, May 2021 – August 2021

San Jose, CA, USA

- › Worked with the Real-Time Algorithms team to enhance video editing solutions.

### University of Maryland

Research Assistant

January 2019 – May 2022

College Park, MD, USA

- › Worked on developing automated techniques to generate 3D animations of human body expressions, such as gaits and gestures, corresponding to different emotions in a variety of social contexts.
- › Developed tracking and trajectory prediction algorithms for dense and heterogeneous crowds and traffic.

### University of Maryland

Teaching Assistant

August 2018 – December 2018

College Park, MD, USA

- › Delivered tutorials, graded assignments and exams for a senior undergraduate course on *Data Structures*.

### Indian Institute of Science

Research Associate

July 2017 – May 2018

Bengaluru, India

- › Developed algorithms for efficient and robust large-scale 3D reconstruction from sets of RGBD images.

### Indian Institute of Science

Teaching Assistant

August 2016 – December 2016

Bengaluru, India

- › Delivered tutorials, set and graded assignments and exams for a graduate course on *Digital Image Processing*.

### Tata Consultancy Services Innovations Lab

Software Engineer Intern

June 2014 – July 2014

Kolkata, India

- › Developed and deployed a secure VPN for on-the-go IoT devices to communicate with each other.

## Education

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### University of Maryland

Ph.D. Computer Science

Advisor: Dinesh Manocha

GPA: 4.0/4.0

2018 – 2022

College Park, MD, USA

### Indian Institute of Science

M.E. System Science and Automation

Advisor: Venu Madhav Govindu

GPA: 6.8/8.0 ( $\equiv$  3.8/4.0)

2015 – 2017

Bengaluru, India

### West Bengal University of Technology

B.Tech. Computer Science and Engineering

2011 – 2015  
GPA: 9.31/10.00 ( $\equiv$  3.9/4.0) Kolkata, India

## Services

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### Conference Senior Program Committee Member

- › AAAI Conference on Artificial Intelligence (AAAI) 2023

### Journal Reviewer

- › ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) 2022
- › ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) Asia 2022
- › Artificial Intelligence Review (AI Review) 2021
- › Computer Vision and Image Understanding (CVIU) 2020
- › IEEE Robotics and Automation Letters (RA-L) 2021

### Conference Reviewer

- › AAAI Conference on Artificial Intelligence (AAAI) 2022, 2021
- › Asian Conference on Computer Vision (ACCV) 2020
- › Conference on Neural Information Processing Systems (NeurIPS) 2022, 2021, 2020
- › European Conference on Computer Vision (ECCV) 2022
- › IEEE/CVF Computer Vision and Pattern Recognition (CVPR) 2022, 2021, 2020
- › IEEE/CVF International Conference on Computer Vision (ICCV) 2021
- › IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2022, 2021
- › IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2020
- › IEEE/RSJ International Conference on Robotics and Automation (ICRA) 2021
- › International Conference on Learning Representations (ICLR) 2022
- › International Conference on Machine Learning (ICML) 2022

### Journal/Conference External Reviewer

- › ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) 2020
- › IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR) 2020
- › IEEE/RSJ International Conference on Robotics and Automation (ICRA) 2020
- › IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2019

### Conference Volunteer

- › AAAI Conference on Artificial Intelligence 2020
- › IEEE/CVF Computer Vision and Pattern Recognition 2019
- › IEEE International Conference on Signal Processing for Communications and Networking 2016

### Campus Placements Coordinator

- › **Indian Institute of Science 2016-17.** Helped schedule industry visits, organize pre-placement talks, and organize and monitor student placement interviews on campus.
- › **Institute of Engineering and Management (under the West Bengal University of Technology) 2014-15.** Helped organize and monitor student placement interviews on campus.

## Awards and Nominations

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- › **UMD Invention of the Year Award 2022 Nominee.** Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, and Dinesh Manocha. "Deepfake Detection Tool".
- › **UMD Invention of the Year Award 2021 Nominee.** Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, and Dinesh Manocha. "M3ER: Multiplicative Multimodal Emotion Recognition".

- › **ACM Multimedia 2021 Best Paper Award Nominee.** Uttaran Bhattacharya, Elizabeth Childs, Nicholas Rewkowski, and Dinesh Manocha. “Speech2AffectiveGestures: Synthesizing Co-Speech Gestures with Generative Adversarial Affective Expression Learning”.
- › **IEEE VR 2021 Best Paper Award.** Uttaran Bhattacharya, Nicholas Rewkowski, Abhishek Banerjee, Pooja Guhan, Aniket Bera, and Dinesh Manocha. “Text2Gestures: A Transformer-Based Network for Generating Emotive Body Gestures for Virtual Agents”.
- › **Adobe Research Fellowship 2021.** Adobe Inc.
- › **ACM SAP 2019 Best Poster Award.** Tanmay Randhavane, Uttaran Bhattacharya, Aniket Bera, Kyra Kapsaskis, Kurt Gray, and Dinesh Manocha. “Identifying Emotions from Walking using Affective and Deep Features”.
- › **Dean’s Fellowship 2018.** University of Maryland.
- › **Outstanding Student Award 2013.** Institute of Engineering and Management (under the West Bengal University of Technology).

## Software and Programming Skills

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<b>ML and Vision</b>	Python (PyTorch, Tensorflow), MATLAB
<b>Web Design</b>	HTML5, Markdown, CSS, JavaScript
<b>Graphics</b>	OpenGL, WebGL, Unity + C#, Unreal Engine + C++, Blender + Python
<b>Documentation</b>	L <sup>A</sup> T <sub>E</sub> X

## Bibliography

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### Refereed Publications

- [22] Tanmay Randhavane, **Uttaran Bhattacharya**, Pooja Kabra, Kyra Kapsaskis, Kurt Gray, Dinesh Manocha, and Aniket Bera. “Learning Gait Emotions Using Affective and Deep Features”. ACM SIGGRAPH Conference on Motion, Interaction and Games (MIG), 2022. *[Oral]*
- [21] **Uttaran Bhattacharya**, Gang Wu, Stefano Petrangeli, Viswanathan Swaminathan, and Dinesh Manocha. “Show Me What I Like: Detecting User-Specific Video Highlights Using Content-Based Multi-Head Attention”. ACM International Conference on Multimedia (ACMMM), 2022. *[Poster]*
- [20] Abhishek Banerjee, **Uttaran Bhattacharya**, and Aniket Bera. “Learning Unseen Emotions from Gestures via Semantically-Conditioned Zero-Shot Perception with Adversarial Autoencoders”. Association for the Advancement of Artificial Intelligence (AAAI), 2022. *[Oral]*
- [19] **Uttaran Bhattacharya**, Gang Wu, Stefano Petrangeli, Viswanathan Swaminathan, and Dinesh Manocha. “HighlightMe: Detecting Highlights from Human-Centric Videos”. IEEE/CVF International Conference on Computer Vision (ICCV), 2021. *[Poster]*
- [18] **Uttaran Bhattacharya**, Elizabeth Childs, Nicholas Rewkowski, and Dinesh Manocha. “Speech2AffectiveGestures: Synthesizing Co-Speech Gestures with Generative Adversarial Affective Expression Learning”. ACM International Conference on Multimedia (ACMMM), 2021. *[Oral][Best Paper Nominee]*
- [17] **Uttaran Bhattacharya**, Nicholas Rewkowski, Abhishek Banerjee, Pooja Guhan, Aniket Bera, and Dinesh Manocha. “Text2Gestures: A Transformer-Based Network for Generating Emotive Body Gestures for Virtual Agents”. IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR), 2021. *[Oral][Best Paper]*
- [16] **Uttaran Bhattacharya**, Nicholas Rewkowski, Pooja Guhan, Niall L. Williams, Trisha Mittal, Aniket Bera, and Dinesh Manocha. “Generating Emotive Gaits for Virtual Agents Using Affect-Based Autoregression”. International Symposium on Mixed and Augmented Reality (ISMAR), 2020. *[Oral]*

- [15] Trisha Mittal, **Uttaran Bhattacharya**, Rohan Chandra, Aniket Bera, and Dinesh Manocha. “Emotions Don’t Lie: A Deepfake Detection Method using Audio-Visual Affective Cues”. ACM International Conference on Multimedia (ACMMM), 2020. *[Poster]*
- [14] **Uttaran Bhattacharya**, Christian Roncal, Trisha Mittal, Rohan Chandra, Kyra Kapsaskis, Kurt Gray, Aniket Bera, and Dinesh Manocha. “Take an Emotion Walk: Perceiving Emotions from Gaits Using Hierarchical Attention Pooling and Affective Mapping”. European Conference on Computer Vision (ECCV), 2020. *[Poster]*
- [13] Rohan Chandra, **Uttaran Bhattacharya**, Trisha Mittal, Aniket Bera, and Dinesh Manocha. “CMetric: A Driving Behavior Measure Using Centrality Functions”. IEEE/RSJ International Conference on Intelligence Robots and Systems (IROS), 2020. *[Oral]*
- [12] Rohan Chandra, Tianrui Guan, Srujan Panuganti, Trisha Mittal, **Uttaran Bhattacharya**, Aniket Bera, and Dinesh Manocha. “Forecasting Trajectory and Behavior of Road-Agents Using Spectral Clustering in Graph-LSTMs”. Robotics and Automation Letters (RA-L), 2020, IEEE/RSJ International Conference on Intelligence Robots and Systems (IROS), 2020. *[Oral]*
- [11] Trisha Mittal, Pooja Guhan, **Uttaran Bhattacharya**, Rohan Chandra, Aniket Bera, and Dinesh Manocha. “EmotiCon: Context-Aware Multimodal Emotion Recognition using Frege’s Principle”. IEEE/CVF Computer Vision and Pattern Recognition (CVPR), 2020. *[Poster]*
- [10] Rohan Chandra, **Uttaran Bhattacharya**, Trisha Mittal, Aniket Bera, and Dinesh Manocha. “GraphRQI: Classifying Driver Behaviors Using Graph Spectrums”. International Conference on Robotics and Automation (ICRA), 2020. *[Poster]*
- [9] Rohan Chandra, **Uttaran Bhattacharya**, Tanmay Randhavane, Aniket Bera, and Dinesh Manocha. “RoadTrack: Realtime Tracking of Road Agents in Dense and Heterogeneous Environments”. International Conference on Robotics and Automation (ICRA), 2020. *[Poster]*
- [8] **Uttaran Bhattacharya**, Trisha Mittal, Rohan Chandra, Tanmay Randhavane, Aniket Bera, and Dinesh Manocha. “STEP: Spatial Temporal Graph Convolutional Networks for Emotion Perception from Gaits”. Association for the Advancement of Artificial Intelligence (AAAI), 2020. *[Spotlight]*
- [7] Trisha Mittal, **Uttaran Bhattacharya**, Rohan Chandra, Aniket Bera, and Dinesh Manocha. “M3ER: Multiplicative Multimodal Emotion Recognition Using Facial, Textual, and Speech Cues”. Association for the Advancement of Artificial Intelligence (AAAI), 2020. *[Oral]*
- [6] **Uttaran Bhattacharya**, and Venu Madhav Govindu. “Efficient and Robust Registration on The 3D Special Euclidean Group”. IEEE/CVF International Conference on Computer Vision (ICCV), 2019. *[Poster]*
- [5] Rohan Chandra, **Uttaran Bhattacharya**, Christian Roncal, Aniket Bera, and Dinesh Manocha. “RobustTP: End-to-End Trajectory Prediction for Heterogeneous Road-Agents in Dense Traffic with Noisy Sensor Inputs”. ACM Computer Science in Cars Symposium (CSCS), 2019. *[Oral]*
- [4] Rohan Chandra, **Uttaran Bhattacharya**, Aniket Bera, and Dinesh Manocha. “DensePeds: Pedestrian Tracking in Dense Crowds Using Front-RVO and Sparse Features”. IEEE/RSJ International Conference on Intelligence Robots and Systems (IROS), 2019. *[Oral]*
- [3] Rohan Chandra, **Uttaran Bhattacharya**, Aniket Bera, and Dinesh Manocha. “TraPHic: Trajectory Prediction in Dense and Heterogeneous Traffic Using Weighted Interactions”. IEEE/CVF Computer Vision and Pattern Recognition (CVPR), 2019. *[Poster]*
- [2] **Uttaran Bhattacharya**, Sumit Veerawal, and Venu Madhav Govindu. “Fast Multiview Registration of 3D Scans using Planar Structures”. International Conference on 3D Vision (3DV), 2017. *[Spotlight]*

- [1] **Uttaran Bhattacharya**, and Dipannita Dey. “Comparative Analysis of Scheduling Algorithms in Computational Grid Environment”. International Journal of Computer Applications 107.4, 2014.

## Patents

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- [3] Trisha Mittal, Uttaran Bhattacharya, Rohan Chandra, Aniket Bera, Dinesh Manocha. “System and Method for Detecting Fabricated Videos”. Patent US20220138472A1. 2022.
- [2] Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, Pooja Guhan, and Dinesh Manocha. “Human Emotion Recognition in Images or Video”. Patent US20210390288A1. 2021.
- [1] Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, and Dinesh Manocha. “System and Method for Multimodal Emotion Recognition”. Patent US20210342656A1. 2021.

## Public Datasets

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### Affective Human Motions

- › EmotionGait                      21-joint 3D MoCap data of emotive walking styles.      <https://go.umd.edu/emotion-gait>
- › EmotionWalk                      16-joint 3D MoCap data of emotive walking styles.      <https://go.umd.edu/ewalk>

### Traffic

- › TRAF                      Dense and heterogeneous urban traffic videos.      <https://go.umd.edu/trafdataset>