Uttaran Bhattacharya

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Professional Experience

Adobe Inc. September 2022 – Present
Research Scientist *San Jose, CA, USA*

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

Google Inc. May 2022 – August 2022
Research Intern *Mountain View, CA, USA*

- Worked on facial expression synthesis.

Adobe Inc. May 2020 – March 2021, May 2021 – August 2021
Research Intern (Remote Internship from College Park, MD, USA) *San Jose, CA, USA*

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

University of Maryland January 2019 – May 2022
Research Assistant *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 August 2018 – December 2018
Teaching Assistant *College Park, MD, USA*

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

Indian Institute of Science July 2017 – May 2018
Research Associate *Bengaluru, India*

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

Indian Institute of Science August 2016 – December 2016
Teaching Assistant *Bengaluru, India*

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

Tata Consultancy Services Innovations Lab June 2014 – July 2014
Software Engineer Intern *Kolkata, India*

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

Education

University of Maryland 2018 – 2022
Ph.D. Computer Science *Advisor: Dinesh Manocha* *GPA: 4.0/4.0* *College Park, MD, USA*

Indian Institute of Science 2015 – 2017
M.E. System Science and Automation *Advisor: Venu Madhav Govindu* *GPA: 6.8/8.0 (≡ 3.8/4.0)* *Bengaluru, India*

West Bengal University of Technology 2011 – 2015
B.Tech. Computer Science and Engineering *GPA: 9.31/10.00 (≡ 3.9/4.0)* *Kolkata, India*

Services

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 (AIRE) *2021*
- Computer Vision and Image Understanding (CVIU) *2020*
- IEEE Robotics and Automation Letters (RA-L) *2021*
- IEEE Transactions on Multimedia (ToM) *2022*

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) *2023, 2022*
- International Conference on Machine Learning (ICML) *2022*
- IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR) *2023*

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

- **ACM MIG 2022 Best Paper Award.** Tanmay Randhavane, Uttaran Bhattacharya, Pooja Kabra, Kyra Kapsaskis, Kurt Gray, Dinesh Manocha, and Aniket Bera. “Learning Gait Emotions Using Affective and Deep Features”.

- **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

ML and Vision	Python (PyTorch, Tensorflow), MATLAB
Web Design	HTML5, Markdown, CSS, JavaScript
Graphics	OpenGL, WebGL, Unity + C#, Unreal Engine + C++, Blender + Python
Documentation	LaTeX

Bibliography

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][Best Paper]*

[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

[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

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