Uttaran Bhattacharya

 Uttaran Bhattacharya   in uttaran-bhattacharya
 uttaranb127.github.io   UttaranB127

Professional Experience

Adobe Inc.
September 2022 – Present
Research Scientist
San Jose, CA, USA
> Working on generation and editing problems for videos and 3D.

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*   *College Park, MD, USA*

Indian Institute of Science
2015 – 2017
M.E. System Science and Automation   *Advisor: Venu Madhav Govindu*   *Bengaluru, India*

West Bengal University of Technology
2011 – 2015
B.Tech. Computer Science and Engineering   *Kolkata, India*

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).

Bibliography

2024

[5] **Uttaran Bhattacharya**, Aniket Bera, and Dinesh Manocha. "Speech2UnifiedExpressions: Synchronous Synthesis of Co-Speech Affective Face and Body Expressions from Affordable Inputs". IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR) 1st Workshop on Human Motion Generation, 2024. *[Full Paper]*

[4] Supreeth Narasimhaswamy, **Uttaran Bhattacharya**, Xiang Chen, Ishita Dasgupta, Saayan Mitra, and Minh Hoai. "HanDiffuser: Text-to-Image Generation With Realistic Hand Appearances". IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), 2024. *[Poster]*

[3] Akash V. Maharaj, Kun Qian, **Uttaran Bhattacharya**, Sally Fang, Horia Galatanu, Manas Garg, Rachel Hanessian, Nishant Kapoor, Ken Russell, Shivakumar Vaithyanathan, and Yunyao Li. "Evaluation and Continual Improvement for an Enterprise AI Assistant". Annual Conference of the North American Chapter of the Association for Computational Linguistics (NAACL) Workshops on Data Science with Human in the Loop (DaSH), 2024. *[Full Paper]*

[2] Ashmit Khandelwal, Aditya Agrawal, Aanisha Bhattacharyya, Yaman K Singla, Somesh Singh, **Uttaran Bhattacharya**, Ishita Dasgupta, Stefano Petrangeli, Rajiv Ratn Shah, Changyou Chen, and Balaji Krishnamurthy. "Large Content And Behavior Models To Understand, Simulate, And Optimize Content And Behavior". International Conference on Learning Representations (ICLR), 2024. *[Spotlight]*

[1] Aneesh Bhattacharya, Manas Paranjape, **Uttaran Bhattacharya**, and Aniket Bera. "DanceAnyWay: Synthesizing Beat-Guided 3D Dances with Randomized Temporal Contrastive Learning". Association for the Advancement of Artificial Intelligence (AAAI), 2024. *[Poster]*

2023

[1] Supreeth Narasimhaswamy, **Uttaran Bhattacharya**, Xiang Chen, Ishita Dasgupta, and Saayan Mitra. "Text-to-Hand-Image Generation Using Pose- and Mesh-Guided Diffusion". IEEE/CVF International Conference on Computer Vision (ICCV) 7th International Workshop on Observing and Understanding Hands in Action, 2023. *[Extended Abstract]*

2022

[3] 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]*

[2] **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]*

[1] 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]*

2021

[3] **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]*

[2] **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]*

[1] **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]*

2020

[10] **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]*

[9] 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]*

[8] **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]*

[7] 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]*

[6] 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]*

[5] 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]*

[4] 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]*

[3] 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]*

[2] **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]*

[1] 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]*

2019

[4] **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]*

[3] 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]*

[2] 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]*

[1] 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]*

2017

[1] **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]*

2014

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

Preprints

[1] Yizhou Wang, Ruiyi Zhang, Haoliang Wang, **Uttaran Bhattacharya**, Yun Fu, and Gang Wu. "VaQuitA: Enhancing Alignment in LLM-Assisted Video Understanding". arXiv preprint arxiv:2309.00359 (2023).

Patents

[5] Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, Pooja Guhan, Dinesh Manocha. "Human Emotion Recognition in Images or Video". Patent US11861940B2. 2024.

[4] Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, Dinesh Manocha. "System and Method for Multimodal Emotion Recognition". Patent US11830291B2. 2023.

[3] Uttaran Bhattacharya, Abhishek Banerjee, Aniket Bera, Pooja Guhan, Dinesh Manocha, Nicholas Rewkowski. "Neural Networks for Generating Emotive Gestures for Virtual Agents". Patent US20230135769A1. 2023.

[2] Gang Wu, Uttaran Bhattacharya, Stefano Petrangeli, Viswanathan Swaminathan. "Highlight Video Generated With Adaptable Multimodal Customization". Patent US11574477B2. 2023.

[1] Trisha Mittal, Aniket Bera, Uttaran Bhattacharya, Rohan Chandra, Dinesh Manocha. "System and Method for Detecting Fabricated Videos". Patent US20220138472A1. 2022.

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

Invited Talks

Current Trends in 3D Pose and Motion Generation

> Purdue University *Host: Aniket Bera*   Apr 23, 2024
> ACM@UMD Speaker Series *Host: ACM@UMD Student Chapter*   Mar 12, 2024

Affective Human Motion Detection and Synthesis

> University of Southern California *Host: Barath Raghavan*   Nov 08, 2022

Services

Conference Senior Program Committee Member

> AAAI Conference on Artificial Intelligence (AAAI)   *2023 − 25*

Journal Reviewer

> ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH)   *2022 − 23*
> ACM Special Interest Group on Computer Graphics and Interactive Techniques (SIGGRAPH) Asia   *2022 − 24*
> Artificial Intelligence Review (AIRE)   *2021*

> Computer Vision and Image Understanding (CVIU)   *2020*
> IEEE Robotics and Automation Letters (RA-L)   *2021*
> IEEE Transactions on Affective Computing (TAffC)   *2023*
> IEEE Transactions on Multimedia (ToM)   *2022*
> IEEE Transactions on Visualization and Computer Graphics (TVCG)   *2023*

Conference Reviewer

> AAAI Conference on Artificial Intelligence (AAAI)   *2021 – 22*
> ACM International Conference on Multimedia (ACMMM)   *2023 – 24*
> Asian Conference on Computer Vision (ACCV)   *2020*
> Conference on Neural Information Processing Systems (NeurIPS)   *2020 – 24*
> European Conference on Computer Vision (ECCV)   *2022 –2– 24*
> IEEE/CVF Computer Vision and Pattern Recognition (CVPR)   *2020 – 2024*
> IEEE/CVF International Conference on Computer Vision (ICCV)   *2021 –2– 23*
> IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)   *2022 – 24, 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 – 24*
> International Conference on Machine Learning (ICML)   *2024, 2022*
> IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR)   *2023 – 24*

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*

Technical Judge

> Immerse the Bay, Stanford XR Hackathon   *2023*

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.

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

Media Coverage

Graduate Student Bhattacharya Receives Adobe Research Fellowship   Apr 05, 2021

> Link: https://www.umiacs.umd.edu/about-us/news/graduate-student-bhattacharya-receives-adobe-research-fellowship

Identifying perceived emotions from people's walking style   Jul 12, 2019

> Link: https://techxplore.com/news/2019-07-emotions-people-style.html

UMD professor builds simulator to train self-driving cars   Apr 4, 2019

> Link: https://dbknews.com/2019/04/04/umd-self-driving-cars-simulation-machine-learning/