Rohan Chandra

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I am a postdoctoral researcher in the AMRL group hosted by Joydeep Biswas.

Education

Ph.D. in Computer Science — **University of Maryland, College Park**
CGPA: 3.8/4.0 — *August 2018 - May 2022*

M.S. in Computer Science — **University of Maryland, College Park**
CGPA: 3.8/4.0 — *August 2016 - May 2018*

B.Tech. in ECE — **Delhi Technological University, New Delhi**
August 2012 - July 2016

Employment

- **UT Austin (current)** — **Austin, TX**
  Postdoctoral Research Fellow, Autonomous Mobile Robotics Laboratory (AMRL) — *June 2022 - Present*
  My current research interests include robot planning, decision-making, and navigation in unstructured human environments, multi-agent RL, and autonomous driving.

Internships

- **NVIDIA** — **Santa Clara, CA**
  Applied Research Intern, Autonomous Driving (Prediction) — *Summer'21 (Remote)*
  Improved ego-vehicle trajectory and behavior prediction via ego-goal conditioning by upto 50%. Improved navigation in particularly hard cases like U-turns and left turns–cases that the model struggled with.

Professional Activities

- Co-chaired the **Intelligent Transportation** session at **ICRA'22**.
- **Workshops organized**:
  - IROS'22: Behavior-driven Autonomous Driving in Unstructured Environments.
- **Invited Talks**:
  - IIIT-Hyderabad, IIIT-Delhi, IIT-Delhi
  - Georgia Tech
  - UPenn
  - WACV'22: Hazard Perception in Intelligent Vehicles (HPIV) Workshop.
  - RSS'21: Perception and Control for Autonomous Navigation in Crowded, Dynamic Environments Workshop.
  - Maryland Robotics Center Student Seminar.
- **Program Committee**:
  - ICCV'21 Workshop on Multi-Agent Interaction and Relational Reasoning.
- **Reviewer**:
  - CVIU'18 -'20, IJCAI'19, CoRL'19, CVPR'20 -'21, AAAI'20 -'21, ICRA'20 -'21, IROS'19 -'20, RAL'20 -'21, NeurIPS'20, ICLR'21, ICML'21, ICCV'21, RSS'22.
- **Graduate Admissions Committee**:
  - 2022-2023: UT Austin CS.
  - 2017-2018: UMD CS

Scholarships, Awards, and Honors

- **(2023)** Selected for the **Rising Stars in AI Symposium 2023**, hosted at KAUST (declined)
- **(2022)** University of Maryland: **Invention of the Year Award 2021** (Finalist): Emotions Don't Lie: Audio-Visual Deepfake Detection using Affective Cues.
- **(2022)** Was named a **RSS Pioneer**.
- **(2021)** Was named a **Future Faculty Fellow**.
- **(2020)** University of Maryland: **Invention of the Year Award** (Finalist) M3ER: Multiplicative Mulimodal Emotion Recognition using Facial, Textual, and Speech Cues
- **(2020)** Awarded the **Summer Research Fellowship** by The Graduate School, UMD.

Publications

Pre-print

1. Trisha Mittal, Puneet Mathur, **Rohan Chandra**, Apurva Bhatt, Vikram Gupta, Debdoot Mukherjee, Aniket Bera, Dinesh Manocha . "Estimating Emotion Contagion on Social Media via Localized Diffusion in Dynamic Graphs".
2. **Rohan Chandra**, Rahul Maligi, Arya Anantula, Joydeep Biswas. SOCIALMAPF: Optimal and Efficient Multi-Agent Path Finding with Strategic Agents for Social Navigation.
3. **Rohan Chandra**, Xijun Wang, Mridul Mahajan, Rahul Kala, Rishitha Palugulla, Chandrababu Naidu, Alok Jain, Dinesh Manocha. METEOR: A Massive Dense & Heterogeneous Behavior Dataset for Autonomous Driving.

Autonomous Driving and Multi-Agent Systems

1. (In **R-AL/IROS 2022**) Tianrui Guan, Divya Kothandaraman, **Rohan Chandra**, Dinesh Manocha. GANav: Group-wise Attention Network for Classifying Navigable Regions in Unstructured Outdoor Environments.
2. (In **ITSC 2022**) **Nilesh Suriyarachchi**, Rohan Chandra, John S Baras, Dinesh Manocha. GAMEOPT: Optimal Real-time Multi-Agent Planning and Control at Dynamic Intersections.
3. (In **WACV 2022**) Tianrui Guan, Jun Wang, Shiyi Lan, **Rohan Chandra**, Zuxuan Wu, Larry Davis, Dinesh Manocha. M3DeTR: Multi-representation, Multi-scale, Mutual-relation 3D Object Detection with Transformers.
4. (In **RAL 2022**) Angelos Mavrogiannis, **Rohan Chandra**, Dinesh Manocha. B-GAP: Behavior-Guided Action Prediction for Autonomous Navigation.
5. (In **ICRA 2022**) **Rohan Chandra**, Mingyu Wang, Mac Schwager, Dinesh Manocha. Game-Theoretic Planning for Risk-Aware Human Drivers.
6. (In **ICRA/RAL 2022**) **Rohan Chandra**, Dinesh Manocha. GamePlan: Game-Theoretic Multi-Agent Planning with Human Drivers at Intersections, Roundabouts, and Merging.
7. (In **IEEE Transactions on ITS 2021**) **Rohan Chandra**, Aniket Bera, Dinesh Manocha. Using Graph-Theoretic Machine Learning to Predict Human Driver Behavior.
8. (In **ICCV 2021**) Divya Kothandaraman, **Rohan Chandra**, Dinesh Manocha. SS-SFDA: Self-Supervised Source-Free Domain Adaptation for Road Segmentation in Hazardous Environments.
9. (In **ICCV 2021**) Divya Kothandaraman, **Rohan Chandra**, Dinesh Manocha. BoMuDA: Boundless Multi-Source Domain Adaptive Segmentation in Unconstrained Environments.
10. (In **IROS 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Trisha Mittal, Aniket Bera, Dinesh Manocha. CMetric: A Driving Behavior Measure Using Centrality Functions.
11. (In **ICRA 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Trisha Mittal, Xiaoyu Li, Aniket Bera, Dinesh Manocha. GraphRQI: Classifying Driver Behaviors Using Graph Spectrums.
12. (In **IROS/RAL 2020**) **Rohan Chandra**, Tianrui Guan, Srujan Panuganti, Trisha Mittal, Uttaran Bhattacharya, Aniket Bera, Dinesh Manocha. Forecasting Trajectory and Behavior of Road-Agents using Spectral Clustering in Graph-LSTMs.
13. (In **ICRA 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Tanmay Randhavane, Aniket Bera, and Dinesh Manocha. RoadTrack: Tracking Road Agents in Dense and Heterogeneous Environments.
14. (In **RAL/ICRA 2020**) AJ Sathyamoorthy, Jing Liang, Utsav Patel, Tianrui Guan, **Rohan Chandra**, Dinesh Manocha. Densecavoid: Real-time navigation in dense crowds using anticipatory behaviors.
15. (In **CSCS 2019**) **Rohan Chandra**, Uttaran Bhattacharya, Christian Roncal, Aniket Bera, Dinesh Manocha. RobustTP: End-to-End Trajectory Prediction for Heterogeneous Road-Agents in Dense Traffic with Noisy Sensor Inputs.
16. (In **IROS 2019**) **Rohan Chandra**, Uttaran Bhattacharya, Aniket Bera, and Dinesh Manocha. DensePeds: Pedestrian Tracking in Dense Crowds Using Front-RVO and Sparse Features.
17. (In **CVPR 2019**) **Rohan Chandra**, Uttaran Bhattacharya, Aniket Bera, and Dinesh Manocha. TraPHic: Predicting Trajectories of Road-Agents in Dense and Heterogeneous Traffic.

Affective Computing

1. (In **ACM'MM, 2020**) Trisha Mittal, Uttaran Bhattacharya, **Rohan Chandra**, Aniket Bera, Dinesh Manocha. "Emotions Don't Lie: An Audio-Visual Deepfake Detection Method Using Affective Cues".
2. (In **ECCV 2020**) Uttaran Bhattacharya, Christian Roncal, Trisha Mittal, **Rohan Chandra**, Aniket Bera, Dinesh Manocha. "Take an Emotion Walk: Perceiving Emotions from Gaits Using Hierarchical Attention Pooling and Affective Mapping".
3. (In **AAAI 2020**(oral)) Trisha Mittal, Uttaran Bhattacharya, **Rohan Chandra**, Aniket Bera, Dinesh Manocha. "M3ER: Multiplicative Multimodal Emotion Recognition Using Facial, Textual, and Speech Cues."
4. (In **AAAI 2020**) Uttaran Bhattacharya, Trisha Mittal, **Rohan Chandra**, Tanmay Randhavane, Aniket Bera, Dinesh Manocha. "STEP: Spatial Temporal Graph Convolutional Networks for Emotion Perception from Gaits."
5. (In **CVPR 2020**) Trisha Mittal, Pooja Guhan, Uttaran Bhattacharya, **Rohan Chandra**, Aniket Bera, Dinesh Manocha. "EmotiCon: Context-Aware Multimodal Emotion Recognition using Frege's Principle".

Students Supervised

- Zayne Sprague (Masters)

Grants/Proposals

- TAS Hub (UKRI)

Teaching Experience

- **CMSC 250: Discrete Mathematics** — **University of Maryland, College Park**
  Taught by Jason Filippou — *Fall'17 and Spring'18*
- **CMSC 131: Introduction to Programming** — **University of Maryland, College Park**
  Taught by Fawzi Emad — *Spring'17*
- **CMSC 417: Computer Networks** — **University of Maryland, College Park**
  Taught by Ashok Agrawala — *Fall'16*

Diversity and Inclusion

- **AI4ALL 2021:** Led a 2 week project for 5-6 high school students. Introduced them to various aspects of machine learning and artificial intelligence.
- **NYU AI School 2021:** Teaching basic machine learning and programming and discussing a career in machine learning research with students from underrepresented minorities.
- **AI4ALL 2020:** Teaching basic machine learning and programming and discussing a career in machine learning research with students from underrepresented minorities.

Patents

- Title: System and Method for Detecting Fabricated Videos U.S. Application No.: 17/515846 Filing Date: November 01, 2021
- Title: System and Method for Multimodal Emotion Recognition U.S. Application No.: 17/173018 Publication Date: February 10, 2021
- Title: Human Emotion Recognition in Images or Video U.S. Application No.: 17/349732 Publication Date: June 16, 2021