Rohan Chandra

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I am a postdoctoral researcher at UT Austin and Texas Robotics working with Dr. Joydeep Biswas and Dr. Peter Stone. My research focuses on algorithms and systems for *human-like* multi-robot navigation in complex, dynamic environments.

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 - May 2016

Employment

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

Scholarships, Awards, and Honors

- **(2023)** Won the **SNU PhD Talk Award**.
- **(2023)** Finalist for the **Charles A. Caramello Distinguished Dissertation Award**.
- **(2023)** Selected for the **Microsoft Future Leaders in Robotics and AI**, hosted at the Maryland Robotics Center.
- **(2023)** Selected for the **Rising Stars in AI Symposium 2023** Speaker Series, 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.

Professional Activities

- **Appointments:**
  - Associate Editor, RA-L (2023 - *)
- **Workshops organized**:
  - RSS'23: Workshop on Multi-Agent Planning and Navigation in Challenging Environments.
  - IROS'23: The 2nd Workshop on Social Robot Navigation: Advances and Evaluation.
  - 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**:
  - **Publicity and Social Media Chair** for the International Symposium on **Multi-Robot & Multi-Agent Systems 2023**.
  - ICCV'21 Workshop on Multi-Agent Interaction and Relational Reasoning.
  - Chaired the **Computer Vision for Autonomous Driving** session at **AAAI'23**.
  - Co-chaired the **Intelligent Transportation** session at **ICRA'22**.
- **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

Publications

Autonomous Driving and Multi-Agent Systems

1. (In **CoRL 2023** (*oral*)) Xiyang Wu, **Rohan Chandra**, Tianrui Guan, Amrit Singh Bedi, Dinesh Manocha. iPLAN: Intent-Aware Planning in Heterogeneous Traffic via Distributed Multi-Agent Reinforcement Learning.
2. (In **R-AL/IROS 2023**) **Rohan Chandra**, Rahul Maligi, Arya Anantula, Joydeep Biswas. SOCIALMAPF: Optimal and Efficient Multi-Agent Path Finding with Strategic Agents for Social Navigation.
3. (In **ICRA 2023**) **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.
4. (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.
5. (In **ITSC 2022**) **Nilesh Suriyarachchi**, Rohan Chandra, John S Baras, Dinesh Manocha. GAMEOPT: Optimal Real-time Multi-Agent Planning and Control at Dynamic Intersections.
6. (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.
7. (In **RAL 2022**) Angelos Mavrogiannis, **Rohan Chandra**, Dinesh Manocha. B-GAP: Behavior-Guided Action Prediction for Autonomous Navigation.
8. (In **ICRA 2022**) **Rohan Chandra**, Mingyu Wang, Mac Schwager, Dinesh Manocha. Game-Theoretic Planning for Risk-Aware Human Drivers.
9. (In **ICRA/RAL 2022**) **Rohan Chandra**, Dinesh Manocha. GamePlan: Game-Theoretic Multi-Agent Planning with Human Drivers at Intersections, Roundabouts, and Merging.
10. (In **IEEE Transactions on ITS 2021**) **Rohan Chandra**, Aniket Bera, Dinesh Manocha. Using Graph-Theoretic Machine Learning to Predict Human Driver Behavior.
11. (In **ICCV 2021**) Divya Kothandaraman, **Rohan Chandra**, Dinesh Manocha. SS-SFDA: Self-Supervised Source-Free Domain Adaptation for Road Segmentation in Hazardous Environments.
12. (In **ICCV 2021**) Divya Kothandaraman, **Rohan Chandra**, Dinesh Manocha. BoMuDA: Boundless Multi-Source Domain Adaptive Segmentation in Unconstrained Environments.
13. (In **IROS 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Trisha Mittal, Aniket Bera, Dinesh Manocha. CMetric: A Driving Behavior Measure Using Centrality Functions.
14. (In **ICRA 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Trisha Mittal, Xiaoyu Li, Aniket Bera, Dinesh Manocha. GraphRQI: Classifying Driver Behaviors Using Graph Spectrums.
15. (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.
16. (In **ICRA 2020**) **Rohan Chandra**, Uttaran Bhattacharya, Tanmay Randhavane, Aniket Bera, and Dinesh Manocha. RoadTrack: Tracking Road Agents in Dense and Heterogeneous Environments.
17. (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.
18. (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.
19. (In **IROS 2019**) **Rohan Chandra**, Uttaran Bhattacharya, Aniket Bera, and Dinesh Manocha. DensePeds: Pedestrian Tracking in Dense Crowds Using Front-RVO and Sparse Features.
20. (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".

Previous Students Supervised

- Divya Kothandaraman (currently PhD, UMD, supervised by Dr. Dinesh Manocha)
- Tianrui Guan (currently PhD, UMD, supervised by Dr. Dinesh Manocha)
- Zayne Sprague (currently PhD, UT Austin, supervised by Dr. Greg Durrett)
- Xiyang Wu (currently PhD, UMD, supervised by Dr. Dinesh Manocha)

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

- Participated in the **Robotics Summer Camp 2023** at UT Austin where I demonstrated Texas Robotics autonomous mobile robot navigation to 20 high school and middle school students.
- **Judged** the special awards category for AAAI at the **International Science and Engineering Fair 2023**. High school students from around the world competed for nearly $9M$ in awards, scholarships at Regeneron ISEF 2023.
- Volunteered for **STEM Girl Day** on the UT Austin Campus: UT Austin's national award-winning STEM Girl Day gives K-8th graders a chance to explore STEM through grade-appropriate, hands-on activities hosted by scientists, engineers, astronomers, and mathematicians.
- Participated in the Future Leaders in Robotics and AI: Celebrating Diversity and Innovation Seminar Series as part of the University of Maryland and Microsoft Robotics and Diversity Initiative. This is a nationwide online seminar series for PhD students and postdoctoral researchers, especially underrepresented minorities and women. The seminar series will highlight the latest research and innovation in the field of robotics and AI. The series is intended to provide exposure and mentorship opportunities to the speakers, build a network of innovators across the country, and support the speakers' career planning.
- **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