

Current Position

- 2022–Present **Assistant Professor**, *Cornell University*, Department of Computer Science
The goal of my research is to enable robots to work seamlessly alongside human partners in the wild. To this end, my work focuses on imitation learning, decision making and human robot interaction. I am interested in settings where a robot continually interacts with humans and its environment in domains such as self-driving and collaborative mobile manipulation.
- 2019–Present **Research Scientist**, *Aurora Innovation*, Motion Planning
We use machine learning to make better driving decisions. Our learned decision making and interactive forecasting approach enables safe, human-like driving.

Education

- 2013–2018 **PhD, Robotics**, *Carnegie Mellon University*, USA
2011–2013 **MS, Robotics**, *Carnegie Mellon University*, USA
2006–2011 **B.Tech, M.Tech, Electrical Engineering**, *Indian Institute of Technology Kharagpur*, India

Research Experience

- 2018–2019 **Postdoctoral Fellow**, *University of Washington*, USA
Worked at Personal Robotics Lab (<https://personalrobotics.cs.washington.edu/>) with Sidd Srinivasa on problems in motion planning, reinforcement learning and imitation learning.
- 2016 **Research Intern**, *Microsoft Research*, USA
Worked with Debadepta Dey, Ashish Kapoor and Gireeja Ranade on information theoretic imitation learning.
- 2011–2017 **Research Engineer**, *Carnegie Mellon University*, USA
Worked at the AirLab (<http://theairlab.org/>) developing the motion planning stack for various robots ranging from full-scale helicopters to small quadrotors.
- 2009–2011 **Research Engineer**, *Indian Institute of Technology Kharagpur*, India
Started an undergraduate research project (<http://krsg.in/>) to design a team of soccer playing robots. Built all robots and participated in international FIRA Mirobot league.
- 2009 **Summer Intern**, *Carnegie Mellon University*, USA
Worked with Sanjiv Singh on coverage path planning algorithms for agricultural robots.
- 2008 **Summer Intern**, *University of Thessaly*, Greece
Worked with Simon Blackmore on localization and mapping for agricultural robots.

Awards and Honors

- 2019 **Best Student Paper at ICAPS**
For the paper titled “Generalized Lazy Search for Robot Motion Planning: Interleaving Search and Edge Evaluation via Event-based Toggles”.
- 2018 **Finalist for IJRR Best Paper of the Year**
For the paper titled “Data-driven Planning via Imitation Learning”.
- 2018 **Finalist for the Collier Trophy**
The AACUS (Autonomous Aerial Cargo/Utility System) project, which was the focus of my thesis research, was a finalist for the trophy awarded “for the greatest achievement in aeronautics or astronautics in America”. Previous winners include Apollo 11, Boeing 747.

- 2018 **Winner of the Howard Hughes Award**
AACUS won the award "for an outstanding improvement in fundamental vertical flight technology".
- 2018 **RSS Pioneers**
For impact in the field of robotics as a graduate student.
- 2014 **Best Paper for Unmanned VTOL Aircraft & Rotorcraft track, AHS**
For the paper titled "The Planner Ensemble and Trajectory Executive: A High Performance Motion Planning System with Guaranteed Safety".
- 2013 **Siebel Scholar**
For academic excellence and demonstrated leadership.
- 2006 **Tata Steel Millenium Scholarship**
For academic excellence.

Technical Experience

languages C++, Python, MATLAB, Java, C#
libraries and tools PyTorch, TensorFlow, ROS

Teaching

- 2019 **Mobile Robots, University of Washington, USA**
Designed and instructed an undergraduate course on mobile robots. Students covered a range of topics in perception, planning and control as well as implemented algorithms on a fleet of 1/10th sized rally cars. Link to course (<https://courses.cs.washington.edu/courses/cse490r/19sp/>)
- 2015 **Statistical Techniques in Robotics, Carnegie Mellon University, USA**
Teaching assistant for Kris Kitani and Michael Kaess
- 2010 **Signals and Systems, Indian Institute of Technology Kharagpur, India**
Laboratory assistant for Dheeman Chatterjee

Mentoring

PhD students Aditya Mandalika (UW), Liyiming Ke (UW), Matthew Schmittle (UW), Gilwoo Lee (UW), Brian Hou (UW), Mohak Bhardwaj (GaTech), Jonathan Spencer (Princeton), Brad Saund (UMich), Rogerio Bonatti (CMU), Gokul Swamy (CMU)

MS students, Researchers Johan Michalove (UW), Ajinkya Kamat (UW), Rosario Scalise (UW), Vishal Dugar (Aurora), Shushman Choudhury (PhD, Stanford), Jit Roy Choudhury (Auro)

Undergrad Interns A. J. Kruse (UW), Max Thompson (UW), Rishabh Madan (IIT), Rajat Jenamani (IIT), Rahul Vernwal (IIT), Anirudh Vemula (PhD, CMU), Mohak Bhardwaj (PhD, GaTech)

Ph.D Thesis Committee Aditya Mandalika (UW), Brian Hou (UW), Arjav Desai (CMU)

Professional Activities

Workshop Organizer Imitation Learning and its Challenges in Robotics, NeurIPS 2018
Machine Learning in Robot Motion Planning, IROS 2018
Complex Collaborative Systems: Closing the Loop, Learning & Self-Confidence, IROS 2017

Reviewer JAIR, IJRR, IEEE-TRO, IEEE RA-L, JFR, AURO, RSS, ICRA, IROS, NeurIPS, ICML, CoRL, ISRR

Invited Talks

- 2022 **Interactive Imitation Learning for Driving Alongside Humans**, *University of Pennsylvania*
F1-Tenth, Spring 2022
- 2022 **Interactive Imitation Learning: Planning Alongside Humans**, *University of Washington*
Robotics Colloquium, Spring 2022
- 2022 **Interactive Imitation Learning: Planning Alongside Humans**, *Cornell University*
Robotics Colloquium, Spring 2022
- 2022 **Interactive Imitation Learning: Planning Alongside Humans**, *University of Southern California*
CS Colloquium, Spring 2022
- 2022 **Interactive Imitation Learning: Planning Alongside Humans**, *Stanford*
Robotics Seminar, Spring 2022
- 2021 **Interactive Imitation Learning for Driving Alongside Humans**, *CMU*
Human-AI Interaction, Fall 2021
- 2021 **Planning with Humans in the Wild: A Tale of Two Interactions**, *Cornell University*
Cornell Seminar Series.
- 2020 **Feedback in Imitation Learning: Confusion on Causality and Covariate Shift**, *ICML*
ICML Workshop on AI for Autonomous Driving.
- 2019 **How can experience help in planning?**, *ONR*
ONR Science of Autonomy Meeting
- 2019 **Learning from Experience in Robot Motion Planning - a Bayesian Perspective**, *MSR Montreal*
MSR Montreal Seminar Series
- 2018 **Robot-Assisted Feeding: From Bite Acquisition to Bite Transfer**, *NRI*
NRI PI Meeting
- 2018 **Bayesian Active Edge Evaluation on Expensive Graphs**, *ONR*
ONR Science of Autonomy Meeting
- 2018 **Data-driven Planning via Imitation Learning**, *ICRA*
Workshop on Informative Path Planning and Adaptive Sampling
- 2017 **Adaptive Motion Planning**, *IROS*
Workshop on Complex Collaborative Systems
- 2016 **Theoretical Limits of Motion Planning as Percolation on Markov Chains**, *MSR*
Adaptive Systems and Interaction (ASI) group at Microsoft Research Redmond

Outreach

- CSMore** Broaden the participation of underrepresented minorities and first-generation college students in computer science through interactive learning, research exposure, and social engagement.
- MuSHR** As postdoc, started and led the Multi-agent System for non-Holonomic Racing (MuSHR) initiative - an open-source, fully functional, robotic race car with advanced sensing and computational capabilities at a fraction of the cost of existing platforms.
- Hobby Robotics** Governor of the Technology Robotix Society, IIT Kharagpur. I was the coordinator for ROBOTIX, a major inter-collegiate event. We also conducted free hands-on workshops across multiple cities, created and managed online tutorials and raised funding.

Robotsoccer Community	Founding member of the Kharagpur RoboSoccer Students Group KRSSG. I led the first Indian team to participate in the international FIRA Mirosot league. We also organized the first Indian leg of the RoboCup league. We raised funding for lab equipments, organized hands-on workshops to recruit undergraduates and promoted the event nationwide to encourage competition.
Lab Tours	Demos and tours of the AirLab and Field Robotics Centre to the general public
Community Outreach	Volunteered at Child Relief and You (CRY) in Kolkata to teach kids from ages 9-13 Volunteered at Rural Development Centre in Kharagpur
Culture Exchange	Member of the JENESYS exchange program in Japan. Took part in cultural activities and presented at the Tokyo embassy on behalf of group.

Publications

Thesis

- [1] S. Choudhury. "Adaptive Motion Planning". 2018.

Journals

- [2] B. Saund, S. Choudhury, S. Srinivasa, and D. Berenson. "The Blindfolded Traveler's Problem: A Search Framework for Motion Planning with Contact Estimates". In: *The International Journal of Robotics Research*. 2022.
- [3] Mohak Bhardwaj, Sanjiban Choudhury, Byron Boots, and Siddhartha Srinivasa. "Leveraging experience in lazy search". In: *Autonomous Robots* 45.7 (2021), pp. 979–996.
- [4] Jonathan Spencer, Sanjiban Choudhury, Matthew Barnes, Matthew Schmittle, Mung Chiang, Peter Ramadge, and Sidd Srinivasa. "Expert Intervention Learning". In: *Autonomous Robots* (2021), pp. 1–15.
- [5] R. Bonatti, W. Wang, C. Ho, A. Ahuja, M. Gschwindt, E. Camci, E. Kayacan, S. Choudhury, and S. Scherer. "Autonomous Aerial Cinematography In Unstructured Environments With Learned Artistic Decision-Making". In: *Journal of Field Robotics* (2019).
- [6] S. Choudhury, V. Dugar, S. Maeta, B. MacAllister, S. Arora, D. Althoff, and S. Scherer. "High Performance and Safe Flight of Full-Scale Helicopters from Takeoff to Landing with an Ensemble of Planners". In: *Journal of Field Robotics* (2019).
- [7] S. Choudhury, M. Bhardwaj, S. Arora, A. Kapoor, G. Ranade, S. Scherer, and D. Dey. "Data-driven Planning via Imitation Learning". In: *The International Journal of Robotics Research* 37.13-14 (2018). **Finalist for Best Paper of the Year**.
- [8] S. Nuske, S. Choudhury, S. Jain, A. Chambers, L. Yoder, S. Scherer, L. Chamberlain, H. Cover, and S. Singh. "Autonomous Exploration and Motion Planning for an Unmanned Aerial Vehicle Navigating Rivers". In: *Journal of Field Robotics* 32.8 (2015).

Conferences

- [9] Gokul Swamy, Sanjiban Choudhury, Drew Bagnell, and Steven Wu. "Causal imitation learning under temporally correlated noise". In: *International Conference on Machine Learning*. PMLR. 2022, pp. 20877–20890.
- [10] Brian Ziebart, Sanjiban Choudhury, Xinyan Yan, and Paul Vernaza. "Towards Uniformly Superhuman Autonomy via Subdominance Minimization". In: *International Conference on Machine Learning*. PMLR. 2022, pp. 27654–27670.
- [11] Mohak Bhardwaj, Sanjiban Choudhury, and Byron Boots. "Blending mpc & value function approximation for efficient reinforcement learning". In: (2021).

- [12] G. Lee, B. Hou, S. Choudhury, and S.S Srinivasa. "Bayesian Residual Policy Optimization: Scalable Bayesian Reinforcement Learning with Clairvoyant Experts". In: (2021).
- [13] Jonathan Spencer, Sanjiban Choudhury, Arun Venkatraman, Brian Ziebart, and J Andrew Bagnell. "Feedback in Imitation Learning: The Three Regimes of Covariate Shift". In: *arXiv preprint arXiv:2102.02872* (2021).
- [14] Gokul Swamy, Sanjiban Choudhury, J Andrew Bagnell, and Steven Wu. "Of Moments and Matching: A Game-Theoretic Framework for Closing the Imitation Gap". In: *International Conference on Machine Learning*. 2021.
- [15] B. Hou, S. Choudhury, G. Lee, A. Mandalika, and S. Srinivasa. "Posterior Sampling for Anytime Motion Planning on Graphs with Expensive-to-Evaluate Edges". In: *IEEE International Conference on Robotics and Automation*. 2020.
- [16] L. Ke, S. Choudhury, M. Barnes, W. Sun, G. Lee, and S. Srinivasa. "Imitation Learning as f-Divergence Minimization". In: *Workshop on the Algorithmic Foundations of Robotics*. 2020.
- [17] P. Sodhi, S. Choudhury, J. G. Mangelson, and M. Kaess. "ICS: Incremental Constrained Smoothing for State Estimation". In: *IEEE International Conference on Robotics and Automation*. 2020.
- [18] J. Spencer, S. Choudhury, M. Barnes, and S. Srinivasa. "Learning from Interventions: Human-robot interaction as both explicit and implicit feedback". In: *Robotics: Science and Systems*. 2020.
- [19] M. Bhardwaj, S. Choudhury, B. Boots, and S. Srinivasa. "Leveraging Experience in Lazy Search". In: *Robotics: Science and Systems*. 2019.
- [20] R. Bonatti, C. Ho, W. Wang, S. Choudhury, and S. Scherer. "Towards a Robust Aerial Cinematography Platform: Localizing and Tracking Moving Targets in Unstructured Environments". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems*. 2019.
- [21] G. Lee, B. Hou, A. Mandalika, J. Lee, S. Choudhury, and S.S. Srinivasa. "Bayesian Policy Optimization for Model Uncertainty". In: *International Conference on Learning Representations*. 2019.
- [22] A. Mandalika, S. Choudhury, O. Salzman, and S.S. Srinivasa. "Generalized Lazy Search for Robot Motion Planning: Interleaving Search and Edge Evaluation via Event-based Toggles". In: *International Conference on Automated Planning and Scheduling*. **Best Student Paper Award Winner**. 2019.
- [23] B. Saund, S. Choudhury, S. Srinivasa, and D. Berenson. "The Blindfolded Robot : A Bayesian Approach to Planning with Contact Feedback". In: *International Symposium on Robotics Research*. 2019.
- [24] R. Vernwal, A. Mandalika, S. Choudhury, and S. Srinivasa. "Lego: Leveraging experience in roadmap generation for sampling-based planning". In: *IEEE/RSJ International Conference on Intelligent Robots and Systems*. 2019.
- [25] R. Bonatti, Y. Zhang, S. Choudhury, W. Wang, and S. Scherer. "Autonomous drone cinematographer: Using artistic principles to create smooth, safe, occlusion-free trajectories for aerial filming". In: *International Symposium on Experimental Robotics*. 2018.

- [26] S. Choudhury, S. Srinivasa, and S. Scherer. "Bayesian Active Edge Evaluation on Expensive Graphs". In: *International Joint Conference on Artificial Intelligence*. 2018.
- [27] M. Bhardwaj, S. Choudhury, and S. Scherer. "Learning Heuristic Search via Imitation". In: *Conference on Robot Learning*. Oral. 2017.
- [28] S. Choudhury, S. Javdani, S. Srinivasa, and S. Scherer. "Near-Optimal Edge Evaluation in Explicit Generalized Binomial Graphs". In: *Advances in Neural Information Processing Systems*. 2017.
- [29] S. Choudhury, A. Kapoor, G. Ranade, and D. Dey. "Learning to Gather Information via Imitation". In: *IEEE International Conference on Robotics and Automation*. 2017.
- [30] S. Choudhury, A. Kapoor, G. Ranade, S. Scherer, and D. Dey. "Adaptive Information Gathering via Imitation Learning". In: *Robotics: Science and Systems*. 2017.
- [31] S. Choudhury, O. Salzman, S. Choudhury, and S. Srinivasa. "Densification Strategies for Anytime Motion Planning over Large Dense Roadmaps". In: *IEEE International Conference on Robotics and Automation*. 2017.
- [32] V. Dugar, S. Choudhury, and S. Scherer. "A KITE in the Wind: Smooth Trajectory Optimization in a Moving Reference Frame". In: *IEEE International Conference on Robotics and Automation*. 2017.
- [33] V. Dugar, S. Choudhury, and S. Scherer. "Smooth Trajectory Optimization in Wind: First Results on a Full-Scale Helicopter". In: *American Helicopter Society Forum*. 2017.
- [34] S. Choudhury, J. D. Gammell, T. D. Barfoot, S. Srinivasa, and S. Scherer. "Regionally Accelerated Batch Informed Trees (RABIT*): A Framework to Integrate Local Information into Optimal Path Planning". In: *IEEE International Conference on Robotics and Automation*. 2016.
- [35] G. A. S. Pereira, S. Choudhury, and S. Scherer. "A Framework for Optimal Repairing of Vector Field-based Motion Plans". In: *IEEE International Conference of Unmanned Aircraft Systems*. 2016.
- [36] G. A. S. Pereira, S. Choudhury, and S. Scherer. "Nonholonomic motion planning in partially unknown environments using vector fields and optimal planners". In: *Congresso Brasileiro de Automatica (CBA)*. 2016.
- [37] A. Tallavajhula, S. Choudhury, S. Scherer, and A. Kelly. "List Prediction Applied To Motion Planning". In: *IEEE International Conference on Robotics and Automation*. 2016.
- [38] S. Arora, S. Choudhury, D. Althoff, and S. Scherer. "Emergency Maneuver Library – Ensuring Safe Navigation in Partially Known Environments". In: *IEEE International Conference on Robotics and Automation*. 2015.
- [39] S. Choudhury, S. Arora, and S. Scherer. "The Planner Ensemble: Motion Planning by Executing Diverse Algorithms". In: *IEEE International Conference on Robotics and Automation*. 2015.
- [40] S. Choudhury and S. Scherer. "The Dynamics Projection Filter (DPF) – Real-Time Nonlinear Trajectory Optimization Using Projection Operators". In: *IEEE International Conference on Robotics and Automation*. 2015.

- [41] S. Choudhury, S. Scherer, and J. A. Bagnell. "Theoretical Limits of Speed and Resolution for Kinodynamic Planning in a Poisson Forest". In: *Robotics: Science and Systems*. 2015.
- [42] J. Paduano, J. Wissler, M. Piedmonte G. Drozeski, N. Dadkhah, J. Francis, C. Shortlidge, J. Bold, F. Langford, M. Chaoui, C. J. Liu, E. Foster, S. Singh, L. Chamberlain, B. Hamner, H. Cover, A. Stambler, A. Singh, S. Nalbone, M. Bergerman, S. Scherer, S. Choudhury, S. Maeta, S. Arora, D. Althoff, D. Maturana, D. Limbaugh, J. Bona, D. Barnhard, D. Chessar, D. Mindell, C. Dominguez, B. Moon, R. Strouse, L. Papautsky, D. Cerchie, B. Chu, J. Graham, C. Cameron, M. Hardesty, and R. Hehr. "TALOS: An Unmanned Cargo Delivery System for Rotorcraft Landing to Unprepared Sites". In: *American Helicopter Society Forum*. 2015.
- [43] S. Arora, S. Choudhury, S. Scherer, and D. Althoff. "A Principled Approach to Enable Safe and High Performance Maneuvers for Autonomous Rotorcraft". In: *American Helicopter Society Forum*. 2014.
- [44] S. Choudhury, S. Arora, and S. Scherer. "The Planner Ensemble and Trajectory Executive: A High Performance Motion Planning System with Guaranteed Safety". In: *American Helicopter Society Forum*. **Best Paper Award Winner**. 2014.
- [45] S. Choudhury, S. Scherer, and S. Singh. "Autonomous Emergency Landing of a Helicopter: Motion Planning with Hard Time Constraints". In: *American Helicopter Society Forum*. 2013.
- [46] S. Choudhury, S. Scherer, and S. Singh. "RRT*-AR: Sampling-based Alternate Routes Planning with Applications to Autonomous Emergency Landing of a Helicopter". In: *IEEE International Conference on Robotics and Automation*. 2013.
- [47] H. Cover, S. Choudhury, S. Scherer, and S. Singh. "Sparse Tangential Network (SPARTAN): Motion Planning for Micro Aerial Vehicles". In: *IEEE International Conference on Robotics and Automation*. 2013.

Workshops and Tech Reports

- [48] Gokul Swamy, Sanjiban Choudhury, J Andrew Bagnell, and Zhiwei Steven Wu. "Sequence Model Imitation Learning with Unobserved Contexts". In: *arXiv preprint arXiv:2208.02225* (2022).
- [49] Aditya Mandalika, Rosario Scalise, Brian Hou, Sanjiban Choudhury, and Siddhartha S Srinivasa. "Guided Incremental Local Densification for Accelerated Sampling-based Motion Planning". In: *arXiv preprint arXiv:2104.05037* (2021).
- [50] Matthew Schmittle, Sanjiban Choudhury, and Siddhartha S Srinivasa. "Learning Online from Corrective Feedback: A Meta-Algorithm for Robotics". In: *arXiv preprint arXiv:2104.01021* (2021).
- [51] Gokul Swamy, Sanjiban Choudhury, J. Andrew Bagnell, and Zhiwei Steven Wu. "A Critique of Strictly Batch Imitation Learning". In: *arXiv preprint arXiv:2110.02063* (2021).
- [52] R. Bonatti, W. Wang, C. Ho, A. Ahuja, M. Gschwindt, E. Camci, E. Kayacan, S. Choudhury, and S. Scherer. "Autonomous Aerial Cinematography In Unstructured Environments With Learned Artistic Decision-Making". In: *Challenges in Vision-based Drones Navigation, IROS* (2019). **Best Paper Award Finalist**.
- [53] B. Hou, S. Choudhury, G. Lee, and S. Srinivasa. "Collision Posteriors on Graphs with Expensive-to-Evaluate Edges". In: *Combining Learning and Reasoning – Towards Human-Level Robot Intelligence, R:SS* (2019).

- [54] G. Lee, S. Choudhury, B. Hou, and S. Srinivasa. "Residual Bayesian Q-Learning for Meta-Reinforcement Learning with Experts". In: *Combining Learning and Reasoning – Towards Human-Level Robot Intelligence, R:SS* (2019).
- [55] S. Srinivasa, P. Lancaster, J. Michalove, M. Schmittle, C. Summers, M. Rockett, J. R. Smith, S. Choudhury, C. Mavrogiannis, and F. Sadeghi. "MuSHR: A Low-Cost, Open-Source Robotic Racecar for Education and Research". In: *arXiv* (2019).
- [56] S. Choudhury, O. Salzman, S. Choudhury, C. Dellin, and S. Srinivasa. "Anytime Motion Planning on Large Dense Roadmaps with Expensive Edge Evaluations". In: *arXiv* (2018).
- [57] G. Lee, S. Choudhury, B. Hou, and S. Srinivasa. "Bayes-CPACE: PAC Optimal Exploration in Continuous Space Bayes-Adaptive Markov Decision Processes". In: *arXiv preprint arXiv:1810.03048* (2018).
- [58] S. Choudhury and S. Srinivasa. "Bayesian Active Edge Evaluation on Expensive Graphs". In: *International Symposium on Robotics Research. Blue Sky Track*. 2017.
- [59] S. Choudhury, S. Srinivasa, and S. Scherer. "A Bayesian Active Learning Approach to Adaptive Motion Planning". In: *Workshop on Acting and Interacting in the Real World, NeurIPS*. 2017.
- [60] S. Choudhury and S. Scherer. *Constrained CHOMP using Dual Projected Newton Method*. Tech. rep. CMU-RI-TR-16-17. Carnegie Mellon University, 2016.
- [61] G. A. S. Pereira, S. Choudhury, and S. Scherer. *Kinodynamic Motion Planning on Vector Fields using RRT**. Tech. rep. CMU-RI-TR-16-35. Carnegie Mellon University, 2016.
- [62] S. Choudhury. *Lower and Upper Bounds for the Survival of Infinite Absorbing Markov Chains*. Tech. rep. CMU-RI-TR-05-04. Carnegie Mellon University, 2015.
- [63] A. Tallavajhula and S. Choudhury. *List prediction for motion planning: Case studies*. Tech. rep. CMU-RI-TR-15-25. Carnegie Mellon University, 2015.
- [64] A. Vemula, S. Choudhury, and S. Scherer. *Learning Motion Planning Assumptions*. Tech. rep. CMU-RI-TR-14-14. Carnegie Mellon University, 2014.
- [65] S. Choudhury, S. Scherer, and S. Singh. *Realtime Alternate Eoutes Planning: The RRT*-AR Algorithm*. Tech. rep. CMU-RI-TR-12-27. Carnegie Mellon University, 2012.

Patents

- [1] R. Bonatti, W. Wang, C. Ho, A. Ahuja, M. Gschwindt, E. Camci, E. Kayacan, S. Choudhury, and S. Scherer. "System for Autonomous Aerial Cinematography in Unstructured Environments With Online Artistic Decision Making". In: *Invention Disclosure 2020-152 (Provisional Patent Filed)*. 2020.
- [2] S. Scherer, S. Choudhury, S. Maeta, D. Althoff, S. Arora, V. Dugar, and B. MacAllister. "A System Decomposition for Real-time Efficient and Safe Motion Generation for Autonomous Flying Systems". In: *Invention Disclosure 2018-007 (Provisional Patent Filed)*. 2018.
- [3] S. Choudhury and S. Scherer. "High-Performance Dynamically Feasible Motion Planning via Adaptive Ensembles of Algorithms". In: *Invention Disclosure 2017-227 (Provisional Patent Filed)*. 2017.

- [4] S.Arora, S.Choudhury, and S.Scherer. "Motion Planning to Enable Safe and Fast Flight of Autonomous Helicopter". In: *Invention Disclosure 2016-090 (Provisional Patent Filed)*. 2016.