



Last Updated: October 27, 2019

**Annual Review**  
 Toyota-CSAIL Joint Research Center  
 Monday October-28-2019; Room 32-G449

- 8:30am – 8:50am Arrival and Breakfast
- 8:50am – 8:55am Welcome and Introductions
- 8:55am – 9:00am TRI Perspective: TRI Staff
- 9:00am – 9:20am Overview of Projects: Daniela Rus, Director of CSAIL

**DRIVING**

- 9:20am – 9:40am *A Parallel Autonomy System: Data-Driven and Model-Based Parallel Autonomy with Robustness and Safety Guarantees* (PIs: Daniela Rus, Sertac Karaman)  
 TRI Liaisons: Steve McGill, Guy Rosman
- 9:40am – 10:00am *Decision Making for Parallel Autonomy in Clutter: Addressing Intent, Interactions, Rules of the Road, and Safety* (PIs: Daniela Rus, Sertac Karaman)  
 TRI Liaisons: Steve McGill, Guy Rosman
- 10:00am – 10:15am *A Safety Interlock for Self-driving Cars* (PIs: Daniel Jackson, Armando Solar-Lezama)  
 TRI Liaisons: Soonho Kong
- 10:15am – 10:30am *Formal Verification Meets Big Data Intelligence to address the Trillion Miles Challenge* (PI: Armando Solar-Lezama)  
 TRI Liaisons: Soonho Kong, Jon DeCastro
- 10:30am – 10:45am **Break**
- 10:45am – 11:00am *Understanding Human Gaze* (PIs: Antonio Torralba, Wojciech Matusik)  
 TRI Liaisons: Simon Stent
- 11:00am – 11:15am *Driver Perception and the Car-to-Driver Handoff* (PI: Ruth Rosenholtz)  
 TRI Liaisons: Simon Stent
- 11:15am – 11:30am *The Car Can Explain!* (PIs: Gerald Sussman, Lalana Kagal)  
 TRI Liaisons: Luke Fletcher, Paul Drews

**ROBOTICS**

- 11:30am – 11:45am *Machines that can Introspect* (PIs: Nick Roy, Boris Katz)  
 TRI Liaisons: Guy Rosman
- 11:45am – 12:00pm *The Robotic Manipulation Data Engine* (PI: Alberto Rodriguez)  
 TRI Liaisons: Naveen Kuppaswamy
- 12:00pm – 12:45pm **Lunch (Room 32-D463)**
- 12:45pm – 1:00pm *Automation for Everyone* (PI: Brian Williams)  
 TRI Liaisons: Calder Phillips-Grafflin

- 1:00pm – 1:15pm *Dense, Freeform Tactile Feedback for Manipulation and Control* (PI: Wojciech Matusik)  
TRI Liaisons: Naveen Kuppuswamy
- 1:15pm – 1:30pm *Exploring the World of High Definition Touch* (PI: Ted Adelson)  
TRI Liaisons: Alex Alspach
- 1:30pm – 1:45pm *Inner Vision: Camera Based Proprioception for Soft Robots* (PIs: Edward Adelson, Daniela Rus)  
TRI Liaisons: Alex Alspach
- 1:45pm – 2:00pm *All Terrain Mobility and Navigation* (PI: Sangbae Kim)  
TRI Liaisons: Siyuan Feng
- 2:00pm – 2:15pm **Break**

**CORE ML & AI**

- 2:15pm – 2:30pm *Crossing the Vision-Language Boundary* (PIs: Jim Glass, Antonio Torralba)  
TRI Liaisons: Simon Stent
- 2:30pm – 2:45pm *Differentiable computer graphics for training and verification of machine perception* (PI: Fredo Durand)  
TRI Liaisons: Soonho Kong, Kunimatsu Hashimoto
- 2:45pm – 3:00pm *Using Deep Learning to Speed Up Deep Learning* (PIs: Saman Amarasinghe, Fredo Durand)  
TRI Liaisons: Paul Drews
- 3:00pm – 3:15pm *Analysis by Synthesis Revisited: Visual Scene Understanding by Integrating Probabilistic Programs and Deep Learning* (PI: Josh Tenenbaum)  
TRI Liaisons: Kunimatsu Hashimoto
- 3:15pm – 3:30pm *Sensible Deep Learning for 3D Data* (PI: Justin Solomon)  
TRI Liaisons: Wadim Kehl
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- 3:30pm – 4:15pm Poster Viewing and Reception – see Appendix A (R&D Commons Area – outside Room 32-G449)
- 4:00pm – 5:00pm Steering Committee Meeting (Room 32-346, Terman Conference Room)

# Appendix A: Posters

## **Cable Manipulation with a Tactile-Reactive Gripper**

Yu She, Shaoxiong Wang, Siyuan Dong, Neha Sunil, Alberto Rodriguez and Edward Adelson

## **Automation for Everyone**

Siyu Dai, Sang Uk Lee, Meng Feng, Jacob Broida, Nikhil Bhargava, Andreas Hofmann, Brian Williams

## **Gaze360: Physically Unconstrained Gaze Estimation in the Wild**

Petr Kellnhofer, Adrià Recasens, Simon Stent, Wojciech Matusik and Antonio Torralba

## **A Safety Interlock for Self-Driving Cars**

Daniel Jackson, Armando Solar-Lezama, Soonho Kong, Nikos Arichega, Jonathan DeCastro, Xin Zhang, Geoffrey Litt, Jeff Chow, Dimitris Koutentakis, Angela Leong, Mike Wang & Uriel Guajardo

## **MapLite: Autonomous Intersection Navigation without Detailed Prior Maps**

Teddy Ort, Rohan Banerjee, Igor Gilitschenski, Liam Paull, Daniela Rus

## **Audio-Visual Fusion with SVD-PHAT**

François Grondin, Hao Tang, James Glass

## **Learning Robust Control Policies for End-to-End Autonomous Driving from Data-Driven Simulation**

Alexander Amini, Igor Gilitschenski, Jacob Phillips, Julia Moseyko, Rohan Banerjee, Sertac Karaman, Daniela Rus

## **Acquiring Language using Captioned Videos**

Candace Ross, Christopher Wang, Yevgeni Berzak, Battushig Myanganbayer, Boris Katz, Andrei Barbu

## **The Car Can Explain!**

Leilani H. Gilpin, Tianye Chen, Lalana Kagal, Gerald Jay Sussman

## **Robots that follow natural language commands**

Nick Roy, Boris Katz, Yen-Ling Kuo, Andrei Barbu, Rohan Paul

## **Learning Risk Level Set Parameters for Safer Autonomous Driving**

Alyssa Pierson, Wilko Schwarting, Sertac Karaman, Daniela Rus

## **Inferring Rules from Demonstrations**

Brandon Araki, Kiran Vodrahalli, Thomas Leech, Cristian-Ioan Vasile, Mark Donahue, Daniela Rus

## **Sharing is Caring: Socially Compliant Autonomous Intersection Negotiation**

Noam Buckman, Alyssa Pierson, Wilko Schwarting, Sertac Karaman, Daniela Rus

## **CARLA**

Rohan Banerjee, Murad Abu-Khalaf, Teddy Ort, Alyssa Pierson, Igor Gilitschenski, Sertac Karaman, Daniela Rus

**Socially Compliant Behavior for Autonomous Driving**

Wilko Schwarting, Alyssa Pierson, Sertac Karaman, Javier Alonso Mora, and Daniela Rus

**Crossing the Vision/Language Boundary**

David Harwath, Adria Recasens, Antonio Torralba, James Glass

**Sensible Deep Learning for 3D Data**

Dmitriy Smirnov, Yue Wang, Justin Solomon

**Taichi: A Programming Language for Differentiable Spatially Sparse Visual Computing**

Yuanming Hu, Tzu-mao Li, Luke Anderson, Jonathan Ragan-Kelley, Frédo Durand

**A Mechanistic Understanding of Situation Awareness**

Benjamin Wolfe, Ruth Rosenholtz

**Dense, freeform tactile feedback for manipulation and control**

Yiyue Luo, Mike Foshey, Yunzhu Li, Wan Shou, Pratyusha Sharma, Antonio Torralba, Wojciech Matusik

