

Collaborative Control of Autonomous Cars

Team Members:

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Faculty Advisor:

Tom Eskridge - teskridge@fit.edu

Client:

Tom Eskridge, affil. Florida Institute of Technology

Progress Matrix

Task	Completion	John	Brennan	Isaya	To Do
Final Adjustments to Local Planner	100%	5%	90%	5%	None
Implement Force Feedback	90%	90%	5%	5%	Workout errors
Scenario Implementation	90%	5%	5%	90%	Two more scenarios on Town10HD
Combination of Discrete Elements	100%	33.3%	33.3%	33.3%	None

Tasks Accomplished

Task 1: Final Adjustments to Local Planner:

The final adjustments to the local planner have been completed, along with a few final changes to dynamic collaborative control. The automated agent no longer believes itself to still be at a red light following intervention from the user, and the steering and throttle have been further disconnected to increase ease of intervention from the user.

Task 2: Implement Force Feedback:

The steering wheel now has force feedback. It has resistance based on what the user likes (it is adjustable). However, the team thought it would be a good idea to add terrain based force feedback. The issue is that CARLA does not have many terrain changes. It is typically the same terrain unless the driver goes on a curb, or something along those lines. There is currently an issue with testing the force feedback, and John has been working on fixing it. The question at this point in the project is - is it worth trying to troubleshoot this issue, or just keep the regular resistance on always, not terrain based so the students can have a successful showcase. The showcase is 4 days after Milestone 6 is due.

Task 3: Scenario Implementation:

As observed in the previous milestone, the issue with the incorrect location of the traffic signals was caused due to the elevation changes we had on the bridge which was overlapping another road. While a temporary fix involved removing the bridge entirely, this solution was deemed suboptimal. Consequently, the decision was made to utilize only the bridge from our custom map for scenario implementation and testing, as its elevation changes met our requirements. To address other scenarios necessitating a cityscape environment with numerous intersections and realistic road conditions, the Town10HD map from Carla was chosen thus scenarios will be implemented and tested on it. Integration of both maps was initially considered but deemed impractical due to potential error complications that we might not have time to fix.

Member Contributions

John Vitali:

John worked solely on the force feedback. The steering wheel has constant resistance which can be changed based on the driver's desire, but terrain has not been fully implemented as of the writing of this progress milestone (Friday, April 12). However, the milestone presentation is due on April 15, so John may be able to get the terrain based force feedback working by the time of the milestone (or showcase).

Brennan Pike:

Brennan's work was solely on the final changes to the dynamic collaborative control and the local planner agent. This work has been completed to the satisfaction of the team.

Isaya Danice:

Isaya, tasked with rectifying bugs within the custom suburb map he generated via RoadRunner, encountered challenges in resolving the traffic signals misplacements. Given time constraints, he prioritized using just the bridge on the custom map for scenarios and will focus on implementing city-like scenarios on the Town10HD map, which better suits our needs.

Plan for Next Milestone

Task	John	Brennan	Isaya
Senior Design Showcase	33.3%	33.3%	33.3%

Dates of Meetings with Client

April 1, 2024 - Talked about minor adjustments to be made, began talking about senior showcase

April 15, 2024 - Last meeting before the showcase. Talked about materials needed for the showcase, and how the project went overall from start to finish.

Faculty Advisor Feedback on each Task:

Task 1: Great work on the planner. This is working very well.

Task 2: Don't worry about terrain force feedback, it is not important to the studies or to the demonstration at the showcase.

Task 3:

Faculty Advisor Signature: _____ Date: _____

Evaluation by Faculty Advisor

- Faculty Advisor: detach this page and return to Dr. Chan or email scores.
- Score (0-10) for each member: circle a score (or circle two adjacent scores for .25 or write down a real number between 0 and 10)

John Vitali	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Brennan Pike	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10
Isaya Danice	0	1	2	3	4	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5	10

Faculty Advisor Signature: _____ Date: _____