DGC 120 Planning team meeting - Week 6

TA:

• Lars Cremean (lars @cds)

Stereovision subteam:

- Jeremy Gillula (jeremy @its)
- Haomiao "H" Huang (haomiao @its)
- Gunnar Ristroph (gunnar @its)

LADAR subteam:

- Mike Thielman (thielman @yahoo.com)
- Kristo Kriechbaum* (kk @its)

Global subteam:

- Alan Somers (somers @its)
- Rocky Velez (rocky @its)
- Les White* (leswhite @adelphia.net)

Planning systems subteam:

- Sue Ann Hong (sueh @its)
- Thyago Consort (thyago @cds)
- Adam Craig (craig @its)
- Luis Goncalves* (luis @vision.caltech.edu)

Email all: team-software @cds.caltech.edu

* = Non-DGC 120 support, minimum time commitment 10 hrs./wk., attend project meetings (Mondays, 8pm, 139 Moore), planning team meetings (Wednesdays, 8pm, 139 Moore), subset of field tests

Meeting Goals and Agenda

Goals:

- ☑ Demonstrate real-time MATLAB display
- ☑ Demonstrate genMap-based navigation in simulation
- ⊠ Update status chart
- \boxtimes Interface issues with vehicles, embedded systems
- I Review, update and prioritize task lists, focused on Sunday's QID
- ⊠ Review and update team timeline

Agenda:

- 8:15 Meeting goals, agenda (assign note taker)
- 8:20 Demonstration of MatlabDisplay (Lars)
- 8:25 Demonstration of genMap-based navigation (Planning systems subteam)
- 8:40 Status chart update (with comments)
- 8:55 Interface issues
- 9:00 Task list review, prioritizing, top fives
- 9:20 Timeline update
- 9:30 Adjourn

DGC 120 Planning team status chart



DGC 120 Planning team

Wednesday, February 11, 2004

DGC 120 Planning team GOTChA chart (Jan 14)

<u>G</u>oals

- ⊠Effectively, quickly, safely and autonomously command the vehicle through the QID course
- Effectively, quickly, safely and autonomously command the vehicle across the entire DGC course
- ⊠Global subteam: Keep vehicle on course and navigate route efficiently

Objectives

- ⊠Average X mph autonomously over ten hours over { A, B, C} type of terrain (A,B,C TBD)
- ⊠Similar objectives for different speeds, driving conditions (enumerated)
- ☑Ability to accurately detect and command around obstacles under various driving conditions
- ⊠ Global: Preprocess waypoint data from RDDF in less than 2 hours (before race)
- ⊠ Global: Never stray off course
- ⊠ Global: Spend minimal time traversing a route

Technical Challenges

- ⊠Not crashing
- ⊠Avoiding other competitors
- ⊠Properly navigating water
- ⊠Terrain classification and proper response
- ⊠Managing "dead end" scenarios
- Effective response to fault information from emb. sys.
- ⊠Global: Accurate registration of static map data in UTM coordinates
- ⊠Robust software capability of running indefinitely without segfaults, runtime errors, memory leaks

<u>Approach</u>

- ⊠Vision and LADAR based sensing
- ⊠Arbiter-based driving framework to handle multiple sensory inputs
- ⊠Integration of software with portable MTAbased embedded system design
- ⊠Use of a priori known information (static maps) about course for navigation

DGC 120 Planning Team Timeline



Bugzilla updates - Task list, Action items

Top Five:

1. Networking in the field

Stereovision subteam:

- 1. SVS tweaking
- 2. Optimization of SVS output and transformations
- 3. genMap testing
- 4. cables, mounting, Firewire cards
- 5. Road following integration

Global:

- 1. CorridorArcEvaluator
- 2. Static map implementation
- 3. Static map generation
- 4. GlobalMapHandler
- 5. Corridor following documentation

LADAR subteam:

- 1. genMap testing
- 2. Geometry measurements
- 3. MATLAB visualization (tweaking and documentation)
- 4. mounting, cables

Planning subteam:

- 1. genMap optimization
- 2. Path evaluation (esp. testing)
- 3. Tool to integrate terrain into simulation runs
- 4. Visualization tool for genMaps (static and real-time)