

ECE 18-649

Mid-Term Project

Presentation

Oct 31, 2014

Group # 11

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Overview

- Project Statistics
- Drivecontrol Design
- Drivecontrol Requirements
- Drivecontrol Statechart/Code
- Drivecontrol Testing
- Lessons Learned
- Open Issues & Suggestions

Project Statistics

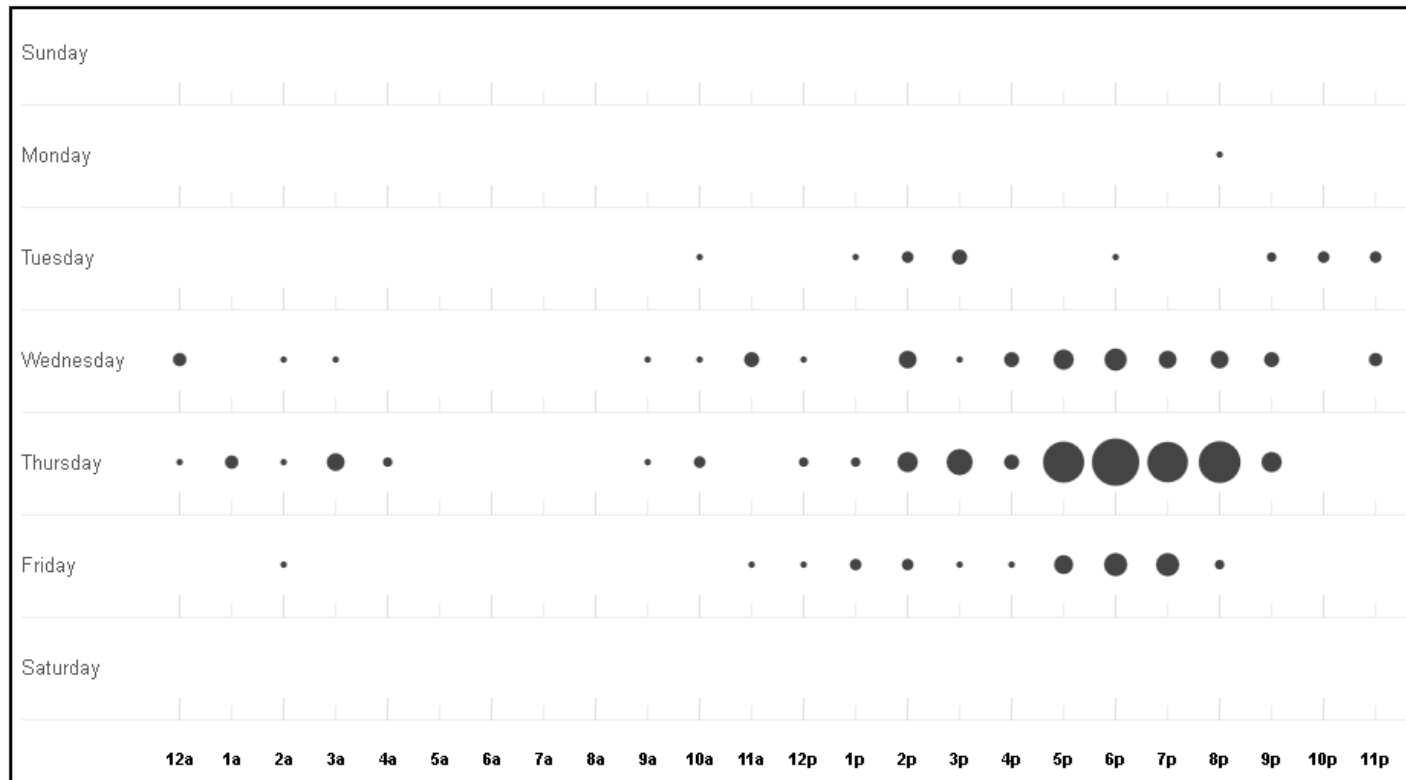
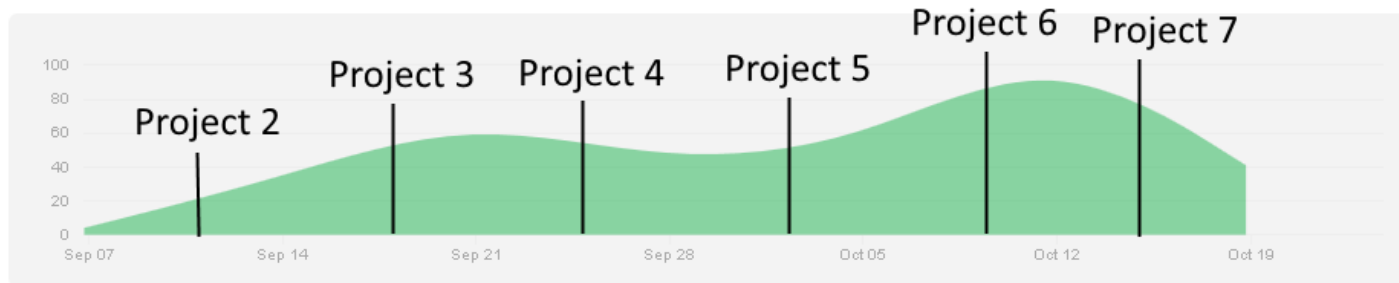
- Number of scenarios/sequence diagrams
 - 18 sequence diagrams
 - 116 sequence diagram arcs
- Number of lines of requirements = 47
- Number of Statecharts
 - 21 states
 - 28 arcs
- Number of lines of non-comment code = 1089
- Approximate lines of code per man hour = 3
- Approximate cost (\$40/h) = \$13,500
- Number of test files written = 30
- Number of revisions = 17
- Number of peer reviews defects found via review
 - 44 defects
 - 44 peer review defects fixed
- Number of defects found via test
 - 9 defects
 - 9 fixed

Project Statistics

Sep 7, 2014 – Oct 24, 2014

Contributions to master, excluding merge commits

Contributions: **Commits** ▾



DriveControl Design

■ Scenarios

- **2C, 3A, 4A** -- Providing speed info to DoorControl
- **6A** - Stopping at a floor
- **8A, 8C** - Moving from one floor to another at slow/fast speed
- **8B** -- Emergency

■ **Scenario 6A** Car moves from hallway f on floor x to adjacent hallway g on floor y and stops

Pre-Conditions:

- Car is at hallway [x, b].
- All elevator doors are closed.
- Car is moving in hoistway.

Scenario:

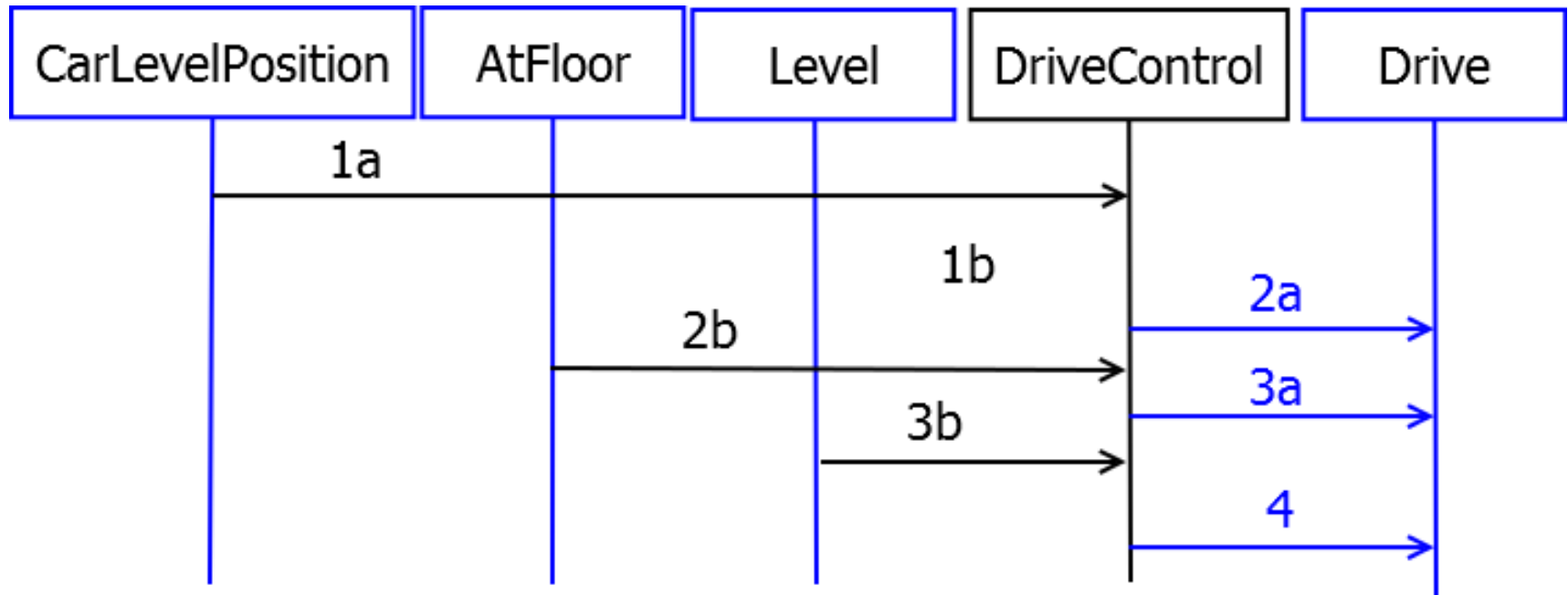
1. Car has reached the commit point of floor y
2. Car arrives at floor y
3. Car levels itself
4. Car stops moving

Post-Conditions:

- Car is at hallway [y, b].
- All elevator doors are closed.
- Drive is stopped.

DriveControl Design

■ Sequence Diagram 6A



1a	mCarLevelPosition = x	3a	Drive = Level, d
1b	CommitPoint[y] = Reached	3b	mLevel[d] = true
2a	Drive = Slow, d	4	Drive = Stop, Stop
2b	mAtFloor[y,g] = true		

Drive Control - Reqs

Constraints ensure safe operation through

- Drive stopped at correct times

- Drive receiving commands at correct times

Requirements

- Copy DriveCommand and DriveSpeed to network

- Basically transitions in statechart

Variables

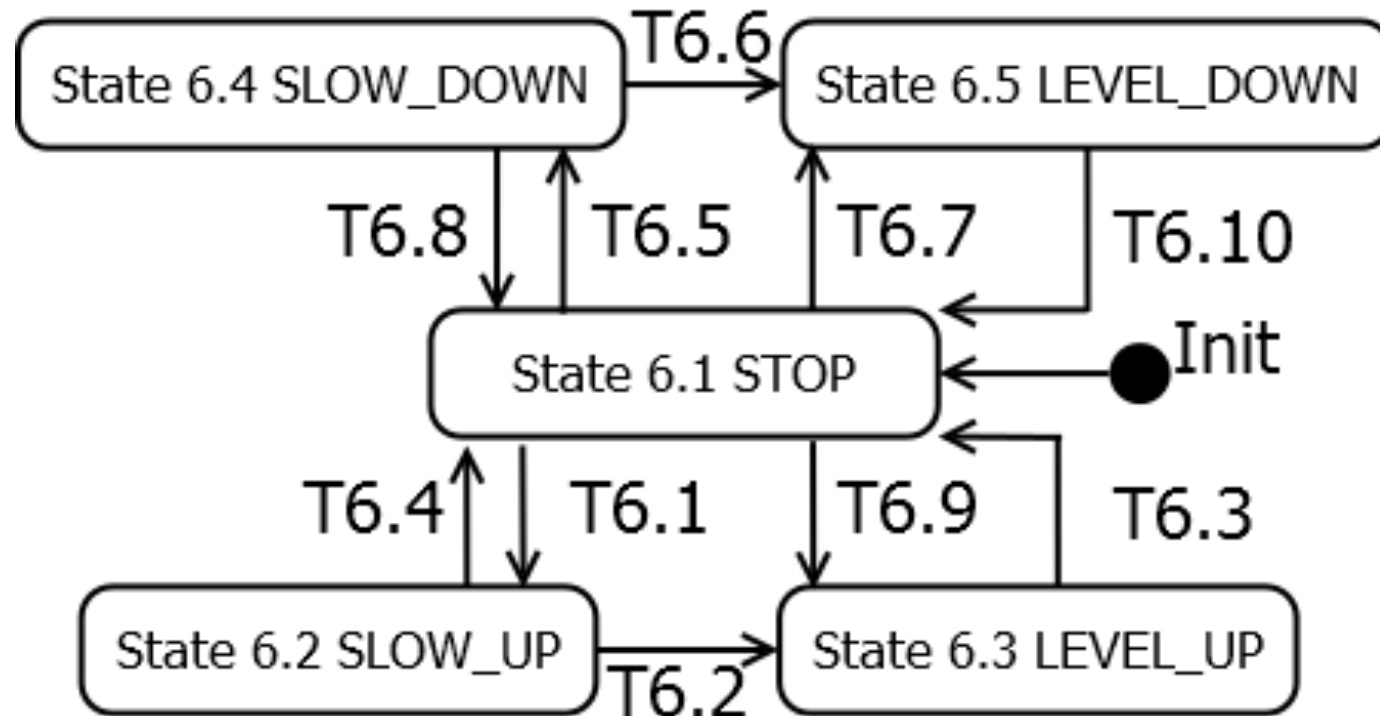
- DesiredDirection = {up, down, stop}

- CommitPoint = {NotReached, Reached, Past}

Design

- Statechart repeated for up and down direction

Drive Control - Statechart/Code



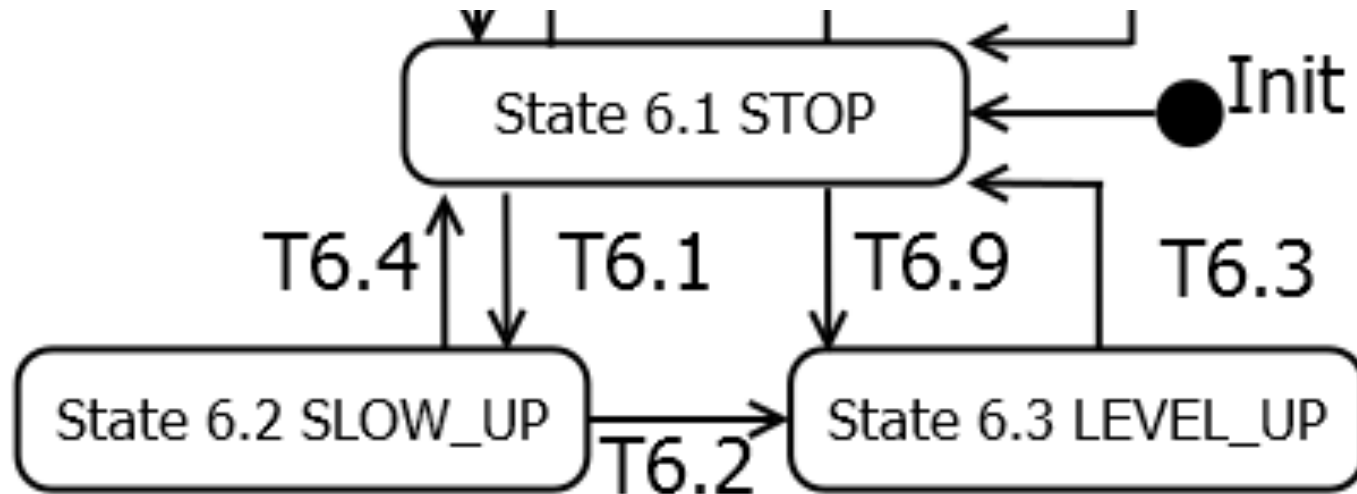
S6.1	Drive = {Stop, Stop}
S6.2	Drive = {Slow, Up}
S6.3	Drive = {Level, Up}
S6.4	Drive = {Slow, Down}
S6.5	Drive = {Level, Down}

All states

mDrive = Drive

mDriveSpeed = DriveSpeed

Drive Control - Statechart/Code



T6.1/5	<code>mDoorClosed[b, r] == true && mCarWeight < MaxCarCapacity && DesiredDirection == Up</code>
T6.2/6	<code>mDesiredFloor.f == CurrentFloor && SlowSpeed >= DriveSpeed.s && CommitPoint[f] == Not Reached</code>
T6.3/7	<code>mEmergencyBrake == true (mLevel[up] == true && mLevel[down] == true && LevelSpeed >= DriveSpeed.s)</code>
T6.4/8	<code>mEmergencyBrake == true DesiredDirection == Down</code>
T6.9/10	<code>mLevel[up] == true && mEmergencyBrake == false</code>

Drive Control - Testing

■ Unit Testing

- Coverage: 100%
- Pass Rate: 100%

■ Integration Testing

- Coverage: 100%
- Pass Rate: 100%

■ Acceptance Testing

- Pass Rate: 100%*
- * Requires additional simulation time

Lessons Learned

- Use scripts, but be careful!
- Check handin format many times
 - Dissatisfying to have completed the work, but receive no credit
 - Made handin mistake 2 times, almost made it 2 other times
 - Learned to have one person submit, and another person check
- Use Revision Control
 - Used Google Drive initially, difficult to merge changes
 - Switched to git in the second project
- Friday meetings
- Tuesday soft deadlines
- Consistent assignment of work

Open Issues & Suggestions

- Open issues
 - Consistent and fair division of labor
 - Better meeting times that work for everyone
- Future suggestions for course
 - Make project website easier to navigate
 - Remove the project during exam week
- Future suggestions for future students
 - Start integrating parts early
 - Do peer reviews
 - Look at the soda machine example