

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 9/18/14

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### Progress Reports

- Project Learning

### Topics of Discussion

- Important Notes
- Questions for Mentors/Vytas
- Individual Goals
- Group Goals (By end of 1<sup>st</sup> Semester):
  - o Cable routing system
  - o Payload design with current motors
  - o DC motor control
  - o Move payload to theoretical tipping points
  - o Find way to tell payload where it is at start up

### Important Dates

- Vytas Sunspiral interview – October 9<sup>th</sup> @ 10:30 AM
- Snapshot – October 14<sup>th</sup>
  - o String up mock payload at the theoretical tipping positions, then hang mass to show it will tip at this point

### Action Items:

- Question for client interview (at least two)
- Figure out what section each group member would like to work on and what that section entails
- Look at tasks at hand and what each entails

# Tensegrity InTernal Actuation (TITAN)

## Minutes – 9/23/14

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### Progress Reports

- Project tasks and subprojects breakdown
  - o Motor control
  - o Packaging motors/payload design/mock science bay
  - o Tipping kinematics
  - o Interfacing motor with encoders

### Topics of Discussion

- Project Timeline: Each person will come up with rough timeline to bring to next meeting, and then we will combine these into a more concrete timeline for snapshot
- Subprojects
- Snapshot deliverables
  - o Mock payload with string lengths at tipping locations
  - o Paraphrase project learning and specs we have learned so far
  - o Modeling encoders
  - o CAD of payload design

### Important Dates

- Vytas Sunspirial interview – October 9<sup>th</sup>
  - o Google hangout (bring laptops)
  - o Final expected deliverables for project
- Snapshot – October 14<sup>th</sup>

### **ACTION ITEMS:**

- Work on individual parts for snapshot
  - o Mark and Kelsey: tipping locations/string lengths
  - o James: CAD of payload
  - o Amy: motor control example with LCD
  - o Dylan: Spec motors
- As you work on projects for snapshot, keep running list of questions for Vytas (questions on the 7<sup>th</sup>)
- Sketch out timeline for semester

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 9/30/14

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### Progress Reports

- Payload – James
- Kinematics and Cable lengths – Kelsey and Mark
- Motor Characterization – Dylan
- Motor Control - Amy

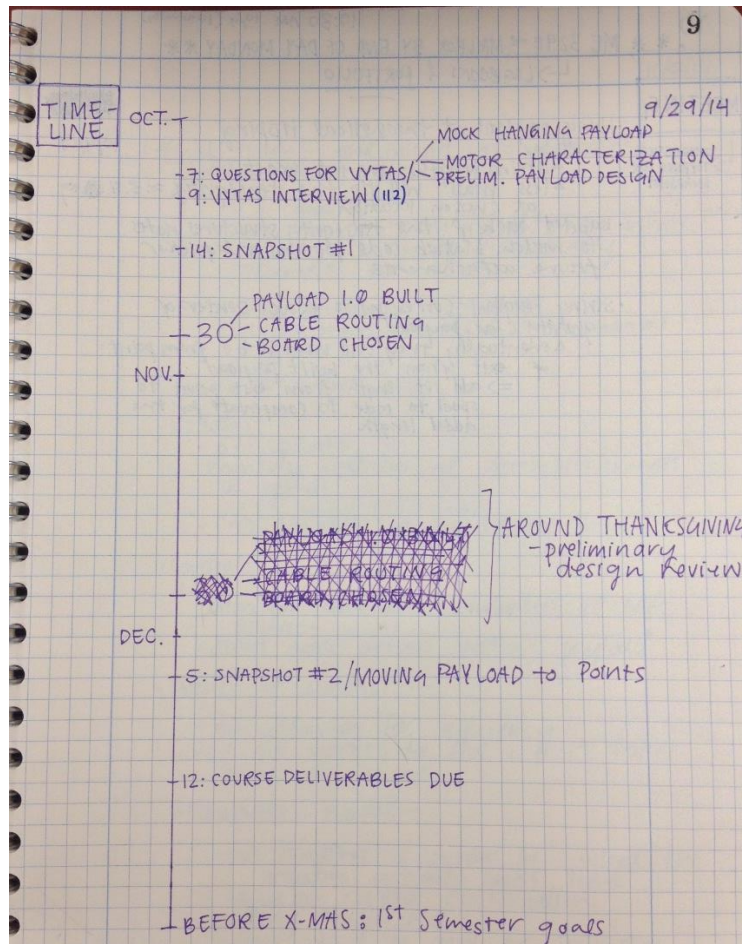
### Topics of Discussion

- Project Timeline
- Snapshot deliverables

### Important Dates

- Vytas Sunspiral interview – October 9<sup>th</sup>
- Snapshot – October 14<sup>th</sup>

### TIMELINE:



Action Items:

- Everyone keep working on individual goals set for snapshot in previous meetings
- Think of questions for Vytas

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 10/7/14

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### Progress Reports

- Payload – James
- Kinematics and Cable lengths – Kelsey and Mark
- Motor Characterization – Dylan
- Motor Control - Amy

### Topics of Discussion

- Log Book/ Portfolio Grading
- Finalize questions for Vytas
- Snapshot deliverables

### Important Dates

- Vytas Sunspiral interview – October 9<sup>th</sup>
- Snapshot – October 14<sup>th</sup>

- Turn in logbooks by end of day Monday 10/13/2014 to Dr. Riley's office or box; remember to fill out evaluation sheet and make entry regarding logbook
- Turn in Portfolio by end of day Monday 10/13/2014 to Dr. Riley's office or box
- Questions for Vytas were finalized and can be seen in the shared folder under client interview topics of discussion
- Final snapshot goals and deliverables were discussed and agreed upon

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 10/14/14

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### Progress Reports

- Payload – James
  - o Materials will be in by end of week; start machining payload when they do
  - o Laser cut payload
- Motor Characterization – Dylan
- Motor Control – Amy
  - o Try to get more than one motor running at once
  - o Current board will run 5 motors, different board will be needed for future
- Tipping Points – Kelsey and Mark
  - o Try to get the equilateral tipping point to work on structure

### Topics of Discussion

- Project Portfolio
- Snapshot setup

### Important Dates

Snapshot – October 14<sup>th</sup>

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 10/21/14

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### Progress Reports

- Payload Manufacturing – James
  - o Box is being laser cut later today
  - o Nylon cubes are done
  - o One spool/mount assembly is machined
- Second triangle tipping points – Mark and Kelsey
  - o Tipping point confirmed
  - o There is some leeway on cable lengths and payload mass
- Motor Characterization – Dylan
- Motor Control – Amy
  - o Only reset button on board; more switches or buttons can be purchased for the future board
  - o See if James' microcontroller will work with the encoders

### Topics of Discussion

- Payload Manufacturing schedule
  - o Meet THURS at 8 AM to machine more of payload
- Controller design
  - o Meet THURS at 2:30 in microcontrollers lab to run encoders and see if everything will work together
- James is gone – 10/28/14
  - o Kelsey will make the agenda for 10/27

### Important Dates

- Mid-semester wikipage due 11/3
  - o Write up bio for the wiki page on yourself
- Design Review – 11/3 – 11/21
- Snapshot Day #2 – 12/5

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 10/28/14

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### Progress Reports

- Payload Manufacturing
  - o Meet 9:30 on Wed 10/29 and Thurs 10/30 to finish up the machining
- Motors
  - o Amy and Dylan are meeting up directly after this meeting to continue encoder work
  - o Started looking for options other than teensy

### Topics of Discussion

- Payload Manufacturing schedule
  - o See above
  - o Mark – get rubber bands for payload
- Controller design
- Integration of motor control
  - o After motors/encoder and setup and payload is built, trial and error to find out all details for actually moving the payload; just do it
  - o Most likely manually zero at first

### Important Dates

- Mid-semester wikipage due 11/3
  - o Write bios and put in shared drive; also include picture
- Design Review – 11/3 – 11/21
  - o Start working on presentation for Vytas
  - o Should be done before thanksgiving break
  - o Set hard timeline for goals
  - o Preliminary design for review
- Snapshot Day #2 – 12/5



# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 11/4/14

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### Progress Reports

- Motor drivers
  - o Still in progress (see below)
- Payload Manufacturing
  - o All finished, now just waiting on motors
- Wiki page
  - o Finished and turned in

### Topics of Discussion

- Motor Drivers design
  - o 5 encoder of teensy board, shows how many revolutions
  - o Need to get all motors running of PWM (which is made for servos but we should be able to get it working with the h-bridges for DC)
- Design Review
  - o Start on PowerPoint structure and outline what we actually want to talk about.
  - o More formal structure, peers will be there
  - o Let Dan know when date is confirmed
- Vytas Update
  - o Include general summary of all progress such as: CAD model, manufacturing of payload, motor data visualization, encoder progress and control board progress
  - o James will draw up draft and send to Vytas
  - o Also include design review availability (Tuesday before Thanksgiving, 11/18 at 11:00 AM)

### Important Dates

- Mid-semester wikipage due 11/3
  - o James and Kelsey will go to wiki page review session
- Design Review – tentatively 11/18 at 11:00 AM

Snapshot Day #2 – 12/5

# Tensegrity InTernal Actuation (TITAN)

## Meeting Minutes – 11/11/14

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### Progress Reports

- Teensy Motor Driving
  - o Motors are running with h-bridges and encoders are working
- Current Design review outline
  - o Meet THURSDAY 11/13 in GJ with assigned slides to put together presentation
- Motor controller design
  - o Buying new teensy, also smaller h-bridges

### Topics of Discussion

- Design Review
  - o 11/18/14 at 11:30 in NIATT conference room
- Next step
  - o Put together payload
  - o Meet on Thursday to try for initial movement
- Infinite potentiometer
- Parts order
  - o Driver and Teensy (x2)
  - o Five colors of wire
  - o Uncoated vectran for cables
  - o Potentiometers
- Everyone's goals
  - o Complete slides for design review
  - o Logbooks are due Monday 11/17 by end of day
  - o Initial movement of payload and construction of payload (video)
- Log book Review 2

### Important Dates

- Design Review – 11/18/14
- Snapshot #2 – 12/5

# Tensegrity InTernal Actuation (TITAN) Meeting Minutes – 11/20/14

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## Progress Reports

### Topics of Discussion

- Design Review Recap
- Finalize sensor we plan to use
  - o acclerometers
- Finalize board
  - o Use Arduino Mega for now
- Geared potentiometer
  - o See if the 10 turn pot will work for our applications
  - o 3D print some gears and set up presentation before break
- Moving payload

### Important Dates

- Snapshot #2 – 12/5
  - o More will be discussed after break