

Meeting Minutes

Purpose	Establish Dr. Kumar as Client
Date	9/5/2018
Time	3:15 PM
Location	GJ
Attendees	Ian, Jared, Zach, Dr. Kumar

Notes

- Kumar is willing to act as a Client & would be available for a bi-weekly meeting
- Kumar is able to provide pressure transducers & signal conditioning (2 PCB, 1 Kistler) (We would have to replace any broken equipment)
- Special consideration of transducer conditions should be taken to extend life, but they will eventually fail
- We will need 3 DAQ systems (time sync for thermocouples, time sync for 0-10v, crank position resolved for pressures)
- Care should be taken when spec'ing DAQs, especially for pressure
- consider card vs usb DAQ input to computers, possibly build computer for this specific application
- Kumar/Dan obtained new gas/solid/liquid analyzer that would be available for use
- possible use of older DAQ system

Tasks (Import to Trello)

- Set meeting time that works with Kumar

Key Dates (Import to Trello)

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Meeting Minutes



Purpose	Finalize contract, assign project layout tasks
Date	9/10/2018
Time	2:30 – 3:00 PM
Location	Mindworks
Attendees	Ben, Jared, Ian (via phone)

Meeting Notes

- Still struggling to develop team name
- Need to develop a Gantt chart – will complete after Product Development is complete
 - Use Excel for high level milestones
 - May be able to integrate with Trello for low level tasks
- Should develop a budget for each client: the team and Dr. Kumar. The team budget should long term and include yearly maintenance costs (i.e. yearly replacement of pressure transducers, software licensing, etc.)

Action Items (Import to Trello)

- Ian – before Thursday 9/13
 - Find meeting time that works with Dr. Kumar
 - Obtain Portfolio Binder (2-3" 3 ring binder)
 - Start portfolio layout
 - Talk with Beyerlein about additional funding
- Ben
 - Draft budget by COB Tuesday 9/11
- Jared
 - Product development needs and metrics by COB Tuesday 9/11 (analyze current deficiencies and how we plan to address them)
 - Schedule SmERF tours during today's CSC meeting, email Ian list of those unable to attend
- ALL – before Thursday 9/13
 - Inspect old DAQ in SmERF for usability
 - Work on budget estimate after Ben has completed the template & Jared has completed product development tasks
 - TEAM NAME
 - Look through mindworks site and identify milestone/important dates, import into Trello

Key Dates (Import to Trello)

- Budget estimate due 9/13/2018

Meeting Minutes

Purpose	Weekly Meeting
Date	Thursday 9/13/2018
Time	2:30 PM
Location	Mindworks
Attendees	Dan, Ben, Ian, Jared

Meeting Notes

- The current budget would benefit from some automation (conditional formatting, formulas, macros, etc)
- PRD needs should be more focused (less broad)
- Cooling should be made a priority

Action Items (Import to Trello)

Item	Owner
PRD	Jared
Gantt Chart	Ian
Improve Budget	Ben
Signals list	All, Monday
Organize Portfolio	Ian, Jared
Find information/specs on myDAQ	Ben

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Weekly meeting
Date	9/20/2018
Time	2:15 PM
Location	Mindworks
Attendees	Ben, Ian, Jared, Zach, Dan

Meeting Notes

- Budget is functional – start using
- Consider adding intake and exhaust pressures (not resolved to crank position)
- meDAQ should be useable
- menial projects (status light, etc.) may be delegated to other sled members
- Horiba may be able to provide serial breakdown

Action Items (Import to Trello)

Item	Owner
FINALIZE GANTT CHART	ALL
Determine how to obtain superflow data	Ian
Determine how to obtain inca data	Ian
Determine how to obtain horiba signals/data	Jared
Spec encoder for in cylinder pressure	Jared
Spec crank synchronous DAQ	Jared
Spec temperature and +/- 10v DAQ	Ben
Schedule 9/25/18 Client meeting	Ian

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Weekly meeting & Client meeting
Date	9/28/2018
Time	2:30
Location	Mindworks
Attendees	Ben, Ian, Jared, Zach, Dan, Dr. Kumar

Meeting Notes

- Jared has been making headway in specifying the encoder and DAQ for in cylinder pressure. An incremental with a Z channel will be selected with a resolution of ~360 ppr.
- Ian has found that Inca data should not be a problem to capture
- Ian is still looking into capturing superflow data
- Ben has found several options for low speed and temperature DAQs
- **The team will switch to focus of the fuel deliver project to making the MAX cart work.**
- Aside from obtaining outputs from the MAX cart, a large cabinet and plumbing system should be designed. This could be a project for younger members

Notes from Dr. Kumar:

- Some considerations when selecting a DAQ
 - Card heights
 - Number of channels
 - Resolution
 - Programmable Function Inputs for encoder triggering
 - Use BNC terminals for easy & robust connections (BNC2090 used by Kumar)
 - Make sure thermocouple connections are of the proper type (small flat, round, etc)
 - Make sure the card and all auxiliaries match
 - Make sure an option for external triggers is selected
- Breaking signals down into high/low speed for DAQ selection
- For the high speed DAQ, simultaneous or shifted collection. Shifted means we will reduce sampling frequency as channel count increases. Most cards are shifted. Something on the order of 1 MHz should suffice (verify this).
- It is possible to use a low speed DAQ with an Analog out to PID control the coolant loop
- Use multi-core conductors with BNC cables (24 – 48 count)
- Consider noise suppression for the in-cylinder pressure transducer. The spark plug will introduce a significant amount of noise.
- NI has a document outlining component suggestions for this type of project
- Cycle to cycle control would be possible with real time OS & controller (out of this project's scope)
- Kumar suggests we use Python for this project. (Anaconda)
- Kumar is willing to temporarily lend us a compact DAQ chassis with the following boards
 - NI9213
 - NI9201
 - NI9263

- Kumar's setup (suggests that it will work for hour high speed sampling)
 - BNC2110 card connector with PCID6351 card
- We should make sure that water/fluid handling processes are streamlined
- Consider upgrading CO detectors to wearables or a wall mount with a readout

Action Items (Import to Trello)

Item	Owner
Talk to Brian about Horiba serial communication	Jared
Look into MAX fuel cart outputs	?
Software Learning	ALL
Signal capturing / data acquisition	ALL
Thermal modeling learning	Jared

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Pre-Snapshot
Date	10-9-2018 (pushed from 10-4-18 to accommodate Dr. Dan)
Time	4:00 PM
Location	Mindworks
Attendees	Ben, Jared, Dan

Meeting Notes

- Logbooks should be submitted to Dr. Dan by Thursday
- A value proposition should be included with team documentation and available during snapshot
- **Dr. Dan has some additional funding available via Thermodynamics demonstration budget. ~\$500 with an absolute maximum of \$1000**
- **Reach out to NIATT for additional funding**
- We can use the analog output Horiba cable from the Christensen DAQ
- Additional BNC cables may be found in the ME supplies room

Meeting Minutes

Purpose	Weekly meeting
Date	10/11/2018
Time	2:30 PM
Location	Mindworks
Attendees	Ian, Ben, Jared, Zach, Dr. Dan

Meeting Notes

- Ian needs to get access to 115
- Horiba serial integration
 - Waiting on Brian to get sniffer
- Serial integration into LabVIEW
 - No direct communication without paid toolkit
 - ASAP 3 support still exists in Inca and can be used
- Software request should be included in NI email
- Hercules or Tiva microcontroller might be a useful alternative for low speed, low resolution data collection
- Cooling model should take priority over combustion analysis
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Action Items (Import to Trello)

Item	Owner
Validation Plan	Ben
Software Learning	All
Inca integration	Ian
Send out NI email	All
Contact superflow	Ian
Explore micro controllers for data collection	Jared
Begin cooling model research	Jared

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Weekly meeting
Date	10/18/2018
Time	2:30 PM
Location	Mindworks
Attendees	Ben, Ian, Jared, Dr. Dan, Zach

Meeting Notes

- Submitted DVP&R to Dan
 - Note that the dyno may have E-Stop capability, currently not functional
- The team spent the first portion of the meeting discussing the lack of forward progress occurring within ODNT
 - Currently, all three core members are failing in regard to devoting an adequate amount of time to the project
 - It was decided that **Tuesdays and Thursdays from 8-5 shall be reserved for working on the project**, outside of classes. Other team members shall not interrupt the senior design team during this time
- Fuel system notes
 - Ben will be looking at this over the next week
 - First step is the replace all flexible fuel hose & connectors to eliminate leakage points
 - All hardware should be catalogued, with pressure requirements noted
 - Investigate to determine if the low pressure system needs to be retained
- Superflow may be able to handle thermocouple data acquisition if API is functional. This would eliminate the need for a thermocouple DAQ.
 - Investigate API functions
- To determine feasibility of microcontrollers as a DAQ alternative, investigate resolution
- Concept design review
 - Have need-to-haves order within 1 week
 - Be able to describe system and data flow
- Jared will write the value proposition

Action Items (Import to Trello)

Item	Owner
Catalogue all fuel system hardware to be replaced	Ben
Track down & price necessary fuel system hardware	Ben
Superflow functions: project learning	Ian
Determine if superflow can handle thermocouple data acquisition	Ian
Determine feasibility of microcontrollers for DAQ	Jared

Develop general thermal model	Jared
Write value proposition	Jared

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Weekly Meeting
Date	10/26/2018
Time	4:00 PM
Location	Mindworks
Attendees	Ben, Ian, Jared, Dan, Zach

Meeting Notes

- Presented Project Value Proposition
 - Last two sentences should be updated to focus more on the big picture
 - The fuel system has been catalogued and new line and fittings have been ordered totaling ~\$30 (Ben completed this)
 - Ian is working on superflow functionality
 - GOAL: should be pulling basic data by next meeting
 - Need to investigate windyn compatibility with newer windows editions
 - Speak with Ankit/Kumar about finding a new computer so that we can run superflow and labview on the same machine.
 - Superflow will work for thermocouple data
 - Tiva-C LaunchPad may be a good option for data collection
 - Zach will contact a family member working @ TI about a potential discount
 - A write up of safety improvement tasks should be provided to Zach for freshmen/sophmores to accomplish by next meeting
 - The wiki page is live
 - meDAQ is not compatible with labview but may be used independently to display in cylinder data as well as output to text file for processing
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Action Items (Import to Trello)

Item	Owner
Wikipage workshop (project description, project progress, team info)	Ian
Thermocouple box organization	Ben
Safety improvement document	Jared (Tuesday)
Talk to Dan about old superflow computer	Ian
Talk to Ankit/Kumar about new computer	Jared
Cooling system diagram	Jared
Cooling system EES code	Jared (next meeting)
Install new fuel system parts	Ben
Update value proposition	Jared (Thursday)

Key Dates (Import to Trello)

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Meeting Minutes

Purpose	Weekly Meeting
Date	11/1/18
Time	2:30 PM
Location	Mindworks
Attendees	Ben, Ian, Jared, Dan, Zach

Meeting Notes

- Ian attended wiki workshop
 - Will complete wiki page draft after this meeting
- Ben organized thermocouple box and took an inventory
 - Will put inventory sheet and pen in box for future updates
 - Will post inventory to shared drive
- Jared has not yet sent out the safety project documentation for this sub project
 - Will be complete before open of business 11/2
- There may be a fluke meter to use for thermocouple measurements, if necessary
- Talk with Ankit/Kumar/CivilEng about locating a flow meter to take measurements of cooling system
- It may or may not be necessary to bypass the engine thermostat when flow measurements
 - If it remains in place, ensure temperature is such that thermostat remains open
- Ian needs assistance with communication/programming; the following resources were brainstormed
 - Kumar
 - John Mcfarlan (spelling?)
 - Ankit
 - Ron

Action Items (Import to Trello)

Item	Owner
Wikipage draft	Ian
Post thermocouple inventory	Ben
Complete safety project doc	Jared
Locate flow meter	Jared
Finish thermal model	Jared
Collect input data for thermal model	Jared
Validate thermal model	Jared
Update labview/superflow computer	Ian
Call superflow	Ian
Establish inca communication	Ian
Obtain data in labview	Ian
Complete fuel system updates	Ben
Select microcontroller	Ben

Key Dates (Import to Trello)

- Design review – NOV 12, 3:00 PM

Meeting Minutes

Purpose	Weekly Meeting
Date	11/8/2018
Time	2:30 PM
Location	Mindworks
Attendees	Ian, Ben, Jared, Dan, Zach

Meeting Notes

- Ian
 - Started wiki page
 - Contacted superflow
 - ~\$700 to update to windows 7
 - ~\$15,000 to update to windows 10
 - CAN communication modules
 - New hardware & software
 - No comms with Inca or LabVIEW yet
 - Need ethernet between 2 computers
- Ben
 - Has inventoried thermocouples, no note of type (i.e. K, J) on inventory list – needs to be added
 - Fuel system updates complete
 - No progress on microcontrollers
- Jared
 - Contacting departments members to locate a flowmeter
 - Coats, Lu, Don Parks are points of contact
 - Cooling system – need to obtain model inputs
 - If we cannot get all inputs, can use models to optimize configurations
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Action Items (Import to Trello)

Item	Owner

Key Dates (Import to Trello)