

Senior Design Meeting - 8/31/22

8/31/22

- Roger - presented slides on our organizational plans
 - we will all have access to each other's work on google drive
 - created and joined a project slack
 - shared google calendar
 - website will be Haki taking point
 - Roger as POC
 - Plans for weekly meetings during senior design
 - will help us stay aware of what each group is doing
 - two main groups
- Borris - talked about importance of full group communication
- Roger - talked about our preliminary safety plans
- Borris - discussed deadlines
 - research outcomes
 - timeline, preliminary BOM
 - Split into two groups (power / control sides)

Questions from Professor Wey

- recommends subsystem breakup
- document subsystems in website
- our breakdown is overestimating how much work there is on the power side
 - possibly restructure
 - how do all the components talk to each other
 - need to figure out a wire harness early on
 - central board? Analog? Digital?
- constantly need to update our subsystems
- how many pins on micro controllers? how many micro controllers?
- preliminary proposal needs to explain how different components connect to each other

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- Wey - we need a block chart and then add more and more details
 - preliminary report - what are we providing
 - what can customer use it for
 - what is the user interface going to look like
- Borris - solar panel - should this be able to hook to any solar panel?
 - Wey - no, it'll be one kit - shouldn't try to make it work with others, that would require other charge controllers
- Borris - should it be charging the battery while running or charge then run?
 - Wey - it should be able to charge and output power at the same time
- Henry - what software for part management would we have access to?
 - Wey - don't let that become the project, you can possibly find something on microsoft office.

Henry - subsystem breakdown

- 3 main parts
 - Power (Solar Panel, Battery, Outlet)
 - Solar Panel Control
 - communications
 - Housing

Where should sensors go? → they should probably be integrated into the block they monitor

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- what kind of Bus should we use?
- we need to break all of these blocks down more

- 5th Block(?) → website and documentation

↳ for project, not UI
↳ should it be a separate block

Way → ↳ it should probably just be something we all contribute to

- not a job for one single person
- no 5th block

- Further breakdown of the blocks

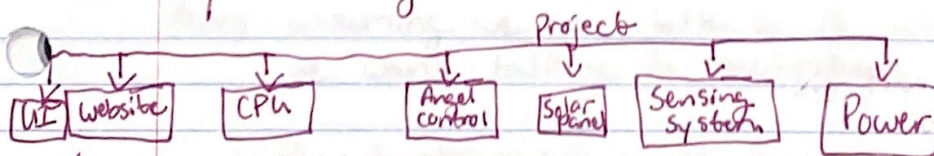
- environmental sensors → CPU
- Voltage and current sensors → Power
- battery temp sensor → CPU
- Panel orientation → control
- Relative solar measurements → CPU
- control display / UI → CPU
- WiFi → CPU
- open loop user control →
- tracking of solar panels → CPU

how do you place
the sensor?

Way → there are other ways you can do panel tracking

- you can use a calendar instead of sensors
- will probably be easier than a sensor
- 5 angles sensors instead

Way - draw organizational chart



↳ someone has to manage this even though everyone contributes

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- We need to break things off from those blades
- Where do these pieces connect?
- everything has to tolerate each other
- Someone needs to manage connections between what's getting done
- someone needs to pick a solar kit to go with
- load based on exposure to sun

Henry - where should we put controllers? How will they connect?

- Zheping - need a super low voltage microcontroller, handles emergency shutdown
- control system that is more power hungry
 - Master/slave system w/ emergency shutdown microcontroller as master
 - pin expander kits for some microcontrollers we should look into

Borris - we don't need temp sensors constantly running - Zheping - safety concern

- Henry - back to high level with Wey's diagram
- we can't talk to the kit

Borris - we will have control of kit based on what's on the market

Henry - assuming we can talk to it, what do we want talking to each other

- CPU - dashboard talking to each other → arduino w/ wifi
- UI - how will it communicate? touchscreen?

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Wey - customer doesn't care what we're using for UI, he wants to know what the UI does

- Zheping - should UI control Wifi?
 - dashboard on controller for local control

Will O - app on phone and control on system (local)

Henry - sensors we need are outlined in part 4B of syllabus

- should motor controllers be on CPU?
 - ↳ no, separate from CPU
- CPU will tell motors to move, will have a tracking program

Wey - one CPU doing everything, how is that a risk? development risk?

- how does it actually get developed with multiple people working?

Zheping - need a set group of commands

- specific language for CPUs to communicate between parts
- between multiple arduinos

Borris - Arduinos are good at communicating with each other

Will A - low power systems need to be defined

Wey - we need to be able to work in parallel on this project

- reduces schedule risk
- we can get more computers than we need to get it done