Senior Design Update

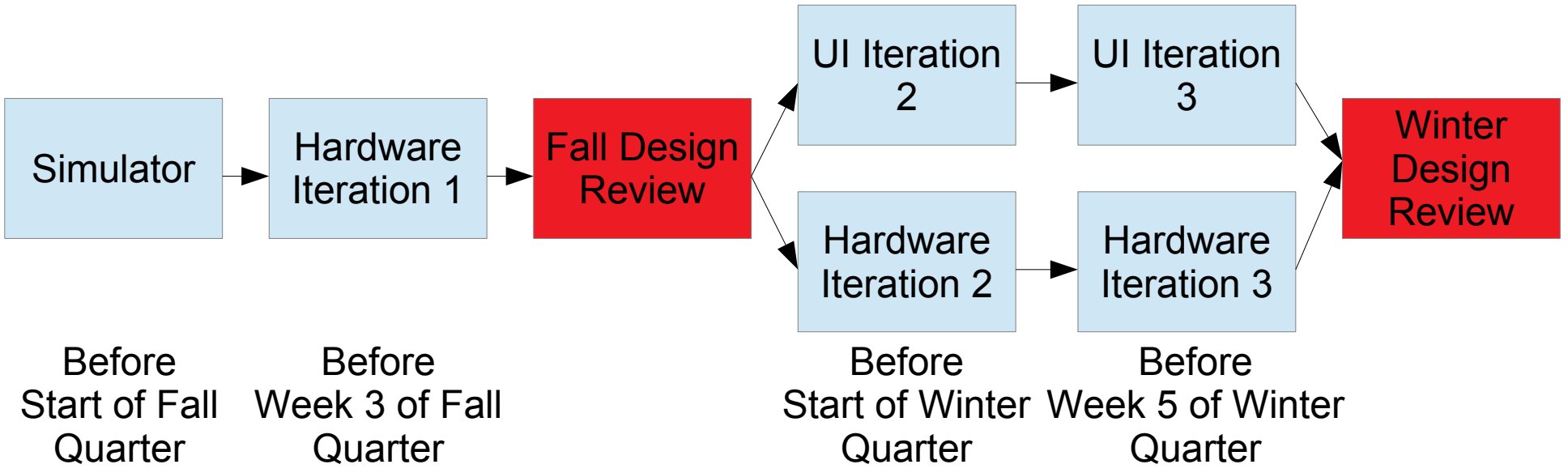
Next Steps

- After current development goals have been reached, each person needs to look at another person's code, add error checking, ensure good practices, and talk to them about how to document their code.
- Documentation should be done in such a way that the Doxygen documentation generator can be used. Documentation will be generated after code refactoring.
- During refactoring, the repository needs to be better organized, and a proper Python package build system needs to be established.
- An FSM must then be developed for the hardware and verified with hardware tests.
- Experimentation must be done with the hardware to determine and understand its capabilities prior to writing the C library for the anchor modules.
- Jesse's central hub Python code will be used for now for central hub operation.

Long-Term Implementation Plan

- Week of 8-13: Code refactoring, documentation generation, build system, initial FSM work
- Week of 8-20: Develop and verify FSM for hardware, begin experimenting with hardware, hardware API documentation research
- Week of 8-27: Plan anchor node and device software development
- Week of 9-3: Develop anchor node and device software so that proper simulations can be run. Verify simulations against hardware tests with algorithms later.

Long-Term Implementation Plan



Long-Term Implementation Plan (cont'd)

- Iteration 1 (before week 3 of fall quarter)
  - Uses off-the-shelf hardware
  - Simply detects a single device using 4 anchor nodes and a central hub
  - Simple user interface
  - Goal: 3 month system lifetime at whatever the hardware cost is

Long-Term Implementation Plan (cont'd)

- Iteration 2 (before start of winter quarter)
  - Design custom PCB taking into account electronic bottlenecks (ex. high bias currents in chip depleting battery)
  - Design and 3D print mechanical structure
  - Begin development of a user interface for the store and the customer as well as database
  - Goal: 2 year system lifetime at under $10

Long-Term Implementation Plan (cont'd)

- Iteration 3 (before week 5 of winter quarter)
  - Design custom PCB seeking best electronic performance
  - Redesign mechanical structure and PCB for compactness and practicality, improving upon previous design
  - Improve UI and database
  - Goal: 5 year system lifetime at under $5

Long-Term Implementation Plan (cont'd)

- Before start of fall quarter – working simulator and a system that lets us easily compile for the device; lock down at least one faculty advisor and determine process for registering project
- Before week 3 of fall quarter – test out different system architectures and determine the best algorithm using simulator/devices; test with the 5 devices; apply for UROP funding and prepare for fall design review; consider potential UROP publication
- Before end of fall quarter – identify system bottlenecks and what custom hardware to use for iteration 2 by simulating different specs; develop plan for store and customer UI implementation; determine if more project recruitment is required to meet design goals; fall design review
- Before start of winter quarter – design iteration 2 hardware and send off to PCB fab; 3D print frame; maybe apply for more UROP funding if possible; have store UI complete
- Before week 5 of winter quarter – design iteration 3 hardware and send off to PCB fab; 3D print improved frame; finish user UI
- Before winter design review – document, demonstrate, and test system; prepare for winter design review; potential patents and other matters

Goals of the Meeting

- Determine current progress on software development and responsibilities for next development phase and refactoring.
- Determine how to organize repo and set up proper Python build system.
- Determine how to verify FSM against hardware.
- Determine expectations and goals for a useful user interface.
- Discuss long-term project timeline and goals. Do they seem reasonable?
- Discuss faculty advisor situation. Whom to ask next?
- Address any concerns, questions, or ideas.