

CS 565 Group Design Project

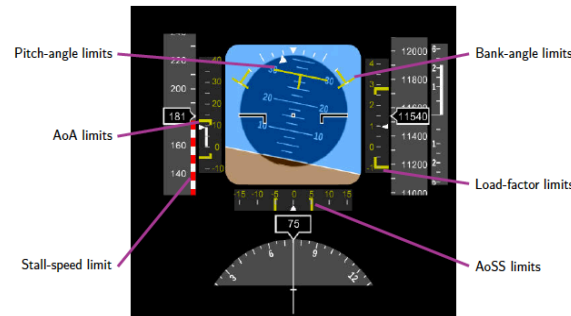
1. If you haven't already, either join or form a group of 2 or 3 students. If solo, email Sneha or post to Piazza for help.
2. If you haven't already, designate 1 group member as your "reporter" and have her or him email Sneha with the names & netids of your group mates..
3. Sneha has already created initial group information on Compass. Please check to ensure accuracy.
4. Your first project deliverable is a 1-slide Powerpoint file submitted by March 5th at 5pm.
5. The 2 classes that week will be devoted to brief group proposals/pitches based on the submitted slide. The purpose is for the class and instructors to provide feedback.
6. Recall from the syllabus that the overall project will be evaluated for it's a) creativity; b) expected utility to users; c) quality and completeness of technical implementation; and d) quality of presentation and reporting. Each item is worth 25% of overall grade.

Engineering Safety-Critical Cyber-Physical-Human (CPH) Systems

Alex Kirlik, Department of Computer Science & Beckman Institute, UIUC

Challenge:

Many standard methods for automating control systems (in cars, planes, etc.) **take the human out of the loop**, resulting in a loss of situation awareness, skill decline, an inability to jump into the control loop when needed.

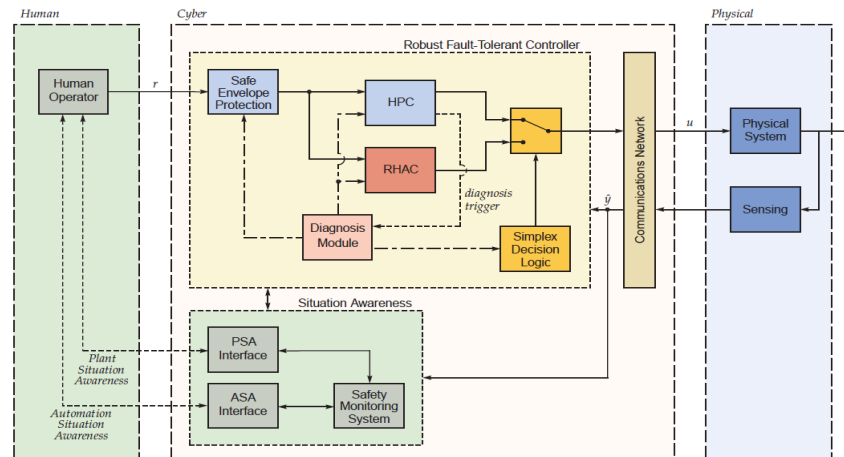


Scientific Impact:

Approach should generalize to CPH systems where safety envelopes can be quantified, control laws or best practices are known and system state can be visualized in the context of these envelopes: **Humans and automation share responsibility** for safe system operation.

Solution:

Repurpose control automation to create novel interface designs visualizing envelopes of safe operation, **keeping the human in the loop**. Humans and automation **cooperate as partners**, compensating for each others' strengths and weaknesses.



Broader Impact:

Aviation (airplanes), highways (intelligent vehicles), medicine (robotic surgery), and other **Cyber-Physical-Human Systems**.

NSF Project #1330077. Co-PIs:
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7. Final project presentations will be made April 24th, 26th and May 1st based on a 5-slide Powerpoint presentation file. This file must be submitted by your group's reporter no later than April 23rd at 5pm. These should include a live demo – if not possible, schedule a (2 or 3) on 1 meeting with Sneha during this period to demo your design to her.
8. By the same deadline as above, your reporter should submit your final, written project report of 10-15 double-spaced pages in length. Use 1-inch margins all around. If you want to include screen shots or other pictorial/graphical material, such should not make up more than 1/3rd of your report. Place any additional such pictorial material at the end of your report in a separate Appendix, that does not count against the page limit.
9. Code Submission: Host your code as a public repository on GitHub. Link this repository at the beginning of your final report. Please ensure all students names are included, as well as your group number, which Sneha is assigning.
10. Final reports should cover (with literature review and citations) the nature of the problem you are attempting to solve, a discussion of how it is significantly novel (given any related such designs), and a detailed description of both functionality and interactive features, including interface design. Provide your rationale behind the major design decisions you had to make, and the criteria and tradeoffs you considered. **Relate design to course material!**