

Ethics and Professional Responsibility

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Project Overview

- Create an interactive application for CPRE 2880 students to better understand the concepts
 - HWs and quizzes
 - Randomized questions and autograding
 - Use emulation tools to simulate microcontrollers
 - Potentially have an emulated Cybot robot interface
- PrairieLearn framework to host the application
- Utilize Python, JavaScript, C and other programming languages
- Hope to inspire other professors to build similar interactive tools for their students

HW1.1. Embedded Systems Applications Which of these appliances/products use an embedded-processor? Drag from here: Construct your solution here: Acoustic guitar Basketball Calculator Printer Screwdriver Shovel Vending machine Washing machine Save & Grade Single attempt Additional attempts available with new variants

Problem Statement

- Students don't get enough practice of concepts
 - Little feedback on Canvas HW submissions
- Not always availability to practice programming on the microcontroller in the lab
- Limited time to meet with Professor and TAs
 - Lab, class, office hours
- Limited capabilities with Canvas platform



What We Are Doing Well: Financial Responsibility

- Our project is free for our users (CPRE 2880 students)
- Professors can host their own course/s for free using PrairieLearn
- Custom emulators/tools can be used in our project with no additional cost
 - Any future tools that are incorporated into our project can also be done at no cost
- Only potential cost is labor and server maintenance



What We Are Doing Not So Well: Work Competence

- Our project is high quality and professional
 - Formatting
 - Functionality
 - Visually professional
- Our project is integrous
 - Maintains integrity of the course and the homeworks it is based off of
- Our project does not meet our original timeline
 - Original timeline was to have a full beta version completed for students to test in Spring 2025
 - The timeline had to be pushed back to have only part of the beta version complete for students to test in Spring 2025 with the rest coming as we finish it



Four Principles Chart

	Beneficence	Nonmaleficence	Respect for Autonomy	Justice
Public health, safety, and welfare	Design helps reduce stress for learning complex 2880 topics	Our project aims to help students improve in 2880 and won't negatively impact their learning/grade	Allows students to work and get extra practice (with feedback) without needing TA or professor help (relieving burdens on graders)	Each student will get randomized versions of the question, showing no favoritism toward any student in the class
Global, cultural, and social	Helps CPRE 2880 students learn course content and achieve high homework, quiz, and exam scores	Students should have a better learning experience than with previous teaching methods	Design can be modified at any time to follow or include the different beliefs of professors and students	All students will have equal access to the platform so no student has advantage over another.
Environmental	Homeworks will be online and autogradable instead of having students use paper for homeworks, quizzes, or exams	Since our project is hosted on ISU servers, because ISU sources a majority of its energy from renewable resources, it causes less harm to the environment	Helps preserve the forests and reduce the burden of paper demand from trees	With preservation of trees and using renewable resources to run servers, we treat all aspects of nature equally better
Economic	PrairieLearn is free for 2880 students to access	Our design will not increase students' cost of tuition since PrairieLearn is free to use	Our design and documentation can serve as a template for other courses to make their own similar instances at no cost to them	Since prairielearn is free, no specific groups of people will have to spend money on it to access it

Potential Ethical Issues

- Cheating/academic dishonesty
 - Dishonest/cheating students get better grades than honest students
 - Cheating students don't learn as well
- Poor teaching outcomes from the application
 - Students may learn less well with our platform than before (when they had physical homework assignments and no autograding)
- Some TAs may be out of a job
 - Less TAs will be needed for the course since there will be less grading and teaching workload.



Conclusion

- Our project has focused on the financial well-being of our users
 - Free for 2880 professors, TAs, and students
- We have deviated from our proposed timeline to only release a partial beta version for next semester
- We have factored in different areas into our project design
 - Public health, safety, and welfare
 - Global, cultural, and social
 - Environmental
 - Economic
- There are still some potential ethical issues that we need to address





Any Questions or Suggestions?

