WISH PROGRAM 2024
DESIGN THINKING PROJECTS

June 2024

In the fourth week, you will be expected to work in a group of four WISH participants to work on a "think project." We will introduce you to the concept of DESIGN THINKING to help you work on the think projects.

- Each project will be carried out by a team (the same team assignment which was made in Week 1).
- The team members must meet and brainstorm on the think project.
- Download at least 5 and at most 10 references (technical papers, documents available online). Your mentors may be able to help you download IEEE papers and provide you a hardcopy in Week 4.
- Prepare a presentation on the think project and present it to your mentors and seek their feedback/suggestions. A suggested template will be as follows.
    1. Title of the presentation and names of presenters (1 slide)
    2. Empathize: How did you research into the needs of the users? (1 slide)
    3. Define: State how you narrowed down the problem (1 slide)
    4. Ideate: State how you challenge assumptions and created ideas (1 slide)
    5. Prototype: Show how you created a prototype (1 slide)
    6. Test: Explain how the prototype helped you to assess ideas get received feedback (1 slide)
    7. Use additional slides only if necessary
- Improve your presentation based on the feedback.
- Do not plagiarize. Refer to existing projects/papers, but solve the problem with a fresh outlook. If you are planning to reuse any figures/ideas, acknowledge the source.

- Your presentation will be graded for
- Innovation
- Technical depth in your proposed solution
- Any prototype you will show (prototype does not mean a working electronic solution – you can build prototypes with paper, ice-cream sticks, cool drink cans, bottles, etc.)
- Quality of the presentation

1. "Smart Jewelry and Clothing"

Can smart jewelry and/or clothing help people to survive and excel in the sociey? Think of various possibilities such as a a jewelry/clothing that can help

- Pregnant women with diabetes?
- People with heart disease
- People with hearing disabilities/vision impairment?
- Old people from falling

Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, cost, battery size/weight, cultural sensitivities.

2. Smart System for Water Conservation

Water conservation is important everywhere – in the kitchen, in laundries, in irrigating plants, etc.

- A leaky tap can waste water.
- A washing machine that is not being run on full load will waste water.
- A farmer wastes water by over-irrigating. Consider any one situation where a smart device can help conserve water.
- Unconsumed water in a water bottle is wasted. Consider any one situation and design a solution to solve the problem. Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, cost, battery size/weight, etc.

3. "Safety First"

There are several safety threats that people face.

- Old people living by themselves may forget to turn off the stove or electrical appliances.
- People who run shops in remote locations or shops that are open at night face threats from criminals.
- People who travel by public transport at night feel insecure.

Consider any one situation above and come up with a device which can help making people safe and secure. Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, cost, battery size/weight, ease of use, etc.

4. "Extended Lighting"

Lack of electricity can be a deterrent for people who wish to run small businesses from their homes. During winter, lack of lighting can eat into the livelihood of vendors who make a living by selling vegetables/fruits etc. What is an affordable solution that they can use to be able to extend their work hours in winter? Consider any one situation and design a solution to solve the problem. Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, initial cost, maintenance cost, and practicality.

5. "e-Buddy"

When students takes up a job in a company or when a student joins the college, they may feel the need to ask a lot of questions – where is a particular meeting/class being held, how can we navigate to that building, etc. Instead of always depending on a colleague to provide these answers, imagine if there is an e-Buddy who can answer these questions. Come up with an e-Buddy design. Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, initial cost, maintenance cost, and practicality.

6. "Smart Toy"

One of the earliest applications of the DSP was a solution called "Speak and Spell" which was a toy that helped children to learn how words are spelt. Can you think of a smart toy that can help people learn a new skill or a new language while also being a fun experience to use it? Think of how personal safety can be taught to children, or water / electricity conservation can be taught to children, etc.

Think of what sensors you will use, what analog electronics may be required, what processor you will use, how the product will be packaged, etc. Be aware of power consumption, initial cost, maintenance cost, and practicality.