

Ethics and Professional Responsibility

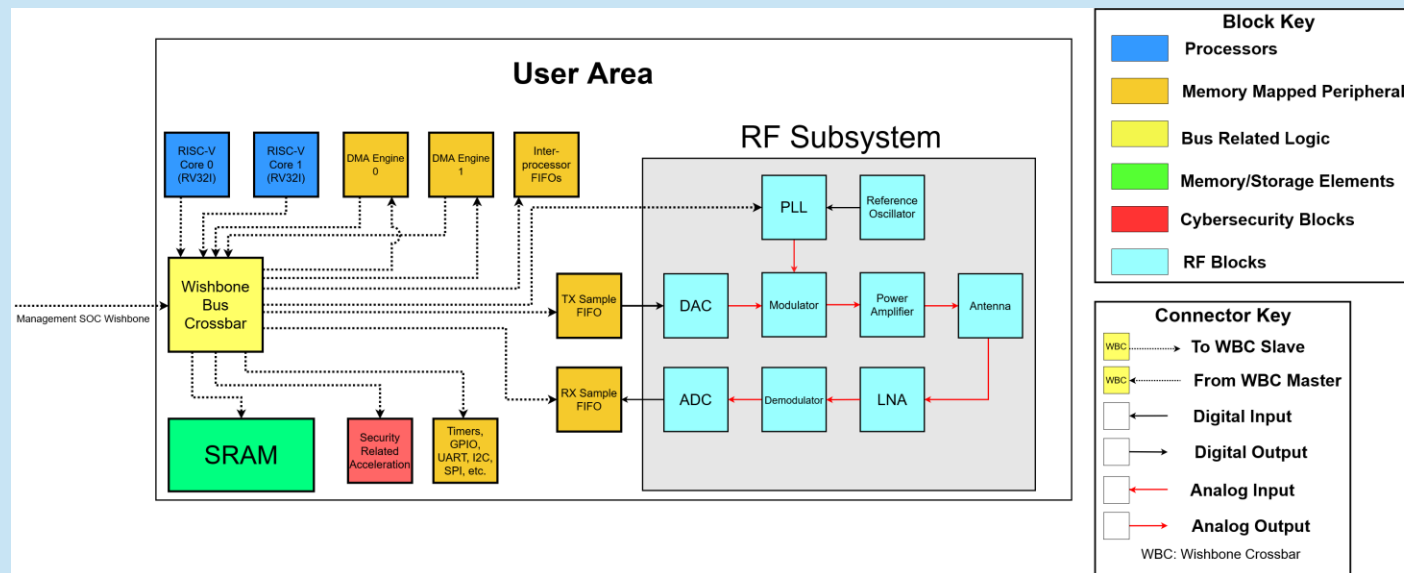
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Client/Advisor: Dr. Duwe

Project Overview

- Design a microcontroller with radio communication capabilities
- Open-source
- Can be fabricated
- Will be used by ISU ChipForge group, possibly faculty and hobbyists
- Designed using the Caravel platform from Efabless



One IDEALS area going well (Property Ownership)

- Implementing ZigBee wireless communication protocol which is copyrighted.
- Additionally using some open-source components in our design
- We have put a lot of time and effort into making sure we are allowed to implement ZigBee and give proper credit to the creators of the open-source components we are using.



One IDEALS area not as good: Sustainability

- Sustainability has not been a major focus of our project.
- We have been more focused on trying to ensure that our designs can function then making them energy efficient.
- To address this, we can focus on lowering the power output of the PLL while still meeting noise requirements.

Potential Ethical Issues

- **Accessibility:** The only knowledge that we assume our base user has is from EE 201. We want to ensure that our project is understandable and useable by these users without any additional knowledge or background.
- **Honest Communication of Security:** Make sure to have clear documentation for users of the level of security being implemented so they can be fully informed on how secure their data is when it is being transmitted.

Broader Context Area-Four Principles Chart

	Beneficence	Nonmaleficence	Respect for Autonomy	Justice
Public Health, Safety, and Welfare	Our design will implement encryption to protect user data	Our design is designed with best practices to avoid potential safety concerns	Design allows complete user control	Our design is tailored towards students and general education about design process.
Global, Cultural, and Social	Allows people without many resources to learn about RF MCUs	Our design will be accessible to people with different experiences and backgrounds in engineering	The open nature of the design allows different users to use it for their unique purposes	The design's documentation and openness combine to allow users from marginalized communities to use it
Environmental	Efabless is utilizing previous processes to reduce waste	Our design is using best practices to reduce excess energy	Users will have some control over power consumption	The Efabless organization and fabrication facilities already exist, so the fairness of environmental impact is determined by Efabless and not us.
Economic	Allows for students and educational institutions to fabricate at a much	The Efabless organization and fabrication facilities	Users can decide to fabricate this design if they want to or just view	This project is entirely open-source and any existing artifacts we pull

Conclusions

Even though our project is designed to be an academic tool, we must consider our ethical obligations to other people and the environment. On its face, our design does not appear to have many external ethical obligations, but after a closer investigation, we still need to consider how our project affects the world around it.