Meeting summary for JU IC-COE Board of Observers Review Meeting April 2024 (01/28/2025)

Quick recap

Shub and Sayan discussed the utilization of funds for the ICCOE project, with a focus on purchases made for various labs and infrastructure. They also explored the development of a prototype for a fast-charging electric vehicle station using $5000 (remaining earmarked funds for ICCOE), the progress of a smart agriculture project, and the readiness gap for PG students. Lastly, they touched on the importance of practical applications, commercial value, and mentorship programs for project success.

Next steps

• Create and share a detailed project plan for the EV charging station prototype, including scope, team members, and timeline by the first two weeks of Feb 2025.

• Present the formal proposal for utilizing the remaining $5,000 ICCOE funds for the EV charging station prototype to the GJUAF board for approval.

• Create a 3-minute video pitch demonstrating the tabletop model of the image restoration system for vehicles, including voice-over explanation – Embedded Systems and AI.

• Continue collaboration with NIMPIT scientists to refine the soil monitoring device and develop a decision matrix for crop yield prediction based on sensor data.

• Compile and share a spreadsheet of all infrastructure elements procured for the ICCOE labs by the end of the week.

• Define the project for the image restoration system for cars, including practical applications and implementation details – Retrofit usage of image restoration for normal non-AV cars.

• Organize a team of 5-6 students to work on the systolic array project for IMEC, supervised by DeboJyoti.

• Arrange a meeting with the metallurgy department to discuss collaboration on memory design and modeling.

• Provide more consistent mentoring to Chandrima on her research direction, focusing on practical applications of transistor and memory design and modeling.

• Coordinate with Nimpit to obtain ideas for the cost function and modeling for the soil analysis project.

• Connect with Mukti for potential collaboration on expanding the soil analysis project to their organic plantation in Sundarban.

• Identify and address the readiness gap for PG students based on their performance in the IMEC project.

• Send out the meeting minutes to all participants.

Summary

ICCOE Project Fund Utilization Report

Shub requests Sayan to provide a detailed report on the utilization of funds for the ICCOE project. The report should include specific information about purchases made for various labs, including embedded projects, GPUs, FPGA boards, computers, software licenses, and infrastructure. Shub emphasizes the need for transparency in fund utilization and project progress. Sayan confirms that an Excel sheet already exists with detailed information about purchases, vendors, and amounts, which can be used to create the required report.

ICCOE Project Progress and Proposal

Shub and Sayan discussed the progress of their projects, particularly the ICCOE project. Shub mentioned that they have around $5,000 remaining from the first round of fundraising, which they plan to utilize for a mini project. The main project they had submitted a proposal for was the development of an EV charging station. Shub will propose to the Global Jadavpur University Alumni Foundation Board to use the remaining funds for this project. Sayan agreed with the proposal and mentioned that he would provide a list of all the infrastructure elements procured for the project by the end of the week. Shub also mentioned that they are conducting an audit process to check on the progress of individual projects and the utilization of funds for infrastructure.

Inductive Charging EV Station Prototype

Shub and Sayan discuss developing a prototype for a fast-charging electric vehicle (EV) station using inductive coupling. They plan to recruit students from different departments to work on various aspects of the project, including the charging process, mechanical structure, and control systems. The prototype will demonstrate the concept of a car wash-style charging station where vehicles can quickly charge without manual plug-in. They aim to show the economic benefits and potential for solving global EV charging infrastructure issues. Sayan outlines three main components: inverter design, secondary coil design, and battery management. Shub emphasizes the need for a clear project scope, benchmarking against existing chargers, and addressing infrastructure challenges such as power sources and charging speeds.

Wireless Charging for Electric Vehicles

In the meeting, the team (Arghajit question) discussed the differences between wireless charging in mobile phones and the proposed wireless charging system for electric vehicles. They clarified that the technology used in both is similar, but the scale and requirements for electric vehicles are much higher. The team also discussed the potential use of Gallium nitride for the charging system, and the need for a high discharge rate and high peak discharge current. They also touched on the need for a project definition and the allocation of funds for the project.

Hardware Development and Real-World Applications

Sheli discussed the development of hardware for image restoration systems on Xilinx and Jetson Nano boards. She mentioned that a comparative analysis of the performance of these boards and Raspberry Pi 4 was conducted, with Jetson Nano and Raspberry Pi 4 showing promising results. Sheli also mentioned that they are in the process of publishing this work, despite facing rejections from several journals. Shub suggested that the project should be more practical and focused on real-world applications, such as improving driver's view in foggy conditions. He also suggested creating a 3-minute video demonstrating the project's potential impact. Sayan agreed, suggesting that the video could be used as a pitch to car manufacturers. Shub emphasized the importance of practical applications and commercial value for the project's success.

Project Progress and New Office Launch

Sheli reported progress on a project presented at Snug, with the involvement of a PhD scholar. Sayan mentioned a new GF office launch in February and the creation of a VLSI group in West Bengal to attract more companies. Shub agreed with the idea of creating a task force to drive this initiative. Sayan also discussed the need for a secondary pool of companies to help colleges create designs for MPW fabrication, as the current condition of colleges and institutes is not conducive to this.

Smart Agriculture Project Progress

In the meeting, Shub and Sheli discussed the progress of a smart agriculture project involving soil monitoring devices. Sheli reported that the device, developed by students, was tested at Nimpit and found to be functional, with data collected and sent to a cloud server. However, there were some issues raised by scientists that needed to be addressed. Shub emphasized the importance of understanding the decision metrics and the impact of the data collected. Sheli also mentioned that the project would be further developed after the exams were finished. Sayan discussed the involvement of a junior team member, Devot Jyothi, in the project and the plan to involve undergraduate students in the project.

Addressing Readiness Gap and Mentorship

In the meeting, Shub and Sayan discussed the readiness gap and the importance of bridging it, particularly for PG students. Shub suggested that individual contributions from undergrads and postgrads should be considered for hiring purposes. They also discussed the mentorship program, with Shub suggesting that Chandrima could help with device modeling and potentially focus on making designs more manufacturable. Shub emphasized the need for Chandrima to think in this direction. The team agreed to continue working on these issues and to send out meeting minute