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Meeting summary for JU IC-COE Board of Observers Review Meeting (07/11/2024)

Quick recap

Sayan and Shub discussed the need for structured mentoring, access to specific PDK cases, and strategies to increase India's engagement with IMEC. They also addressed the challenges of creating a faculty pool for training, the need for License Installation Steps validation by the SNPS licensing team, and the upcoming submission of a technical bid followed by a financial bid for the computers for AMS Lab. Lastly, they discussed the lack of faculty leadership and mentorship, the challenges in the IoT lab, and the importance of having students work on real projects. They discussed ways to address this.

Next steps

• Shub to contact Global Foundries for PDK access to 12LP technology.

• Sayan to arrange a meeting with Shub, Mrinal, Joydeep, and Nirmoy to discuss 180nm PDK requirements and fabrication plans for AMS design.

• Sayan to identify a water-related IoT project with Prof. Pankaj Roy of Water Resource Engineering department and engage the students for implementation.

• Shub and Sibendu to provide architectural guidance for the selected IoT project. Shub to engage UTL firmware and hardware engineers for hands-on technical guidance on the project (train them).

• Shelly to recruit students from other departments (e.g. mechatronics, instrumentation) for the IoT project.

Summary

Structured Mentoring and PDK Access Discussion

Sayan and Shub discussed the need for structured mentoring and access to specific PDK cases following their Globalfoundries collaboration. Shub agreed to re-engage with the GF team to address the lack of follow-up and seek access to 12 LP from global foundries for the installation process. Sayan confirmed his readiness to proceed once Shub secured the necessary PDK access and documentation. They also discussed a pending issue regarding access to the TSMC/IMEC 180 nanometer pdk, which required connection through an Indian partner from IMEC. Shub suggested seeking help from Dr. Santanu Das to push the IMEC Belgium team and accelerate the IMEC India team's actions forward. It was discussed not to rely on the pdk availability from IMEC at this point.

Discussing 180 Nanometer Project Requirement

Shub and Sayan discussed the requirement for a 180 nanometer diameter for a project related to student work. Sayan explained that this requirement arose from the familiarity of Nirmoy and Joydeep with TSMC 180 nanometers. Shub/Mrinal suggested that they could consider using a different diameter, but noted that the choice should be driven by a specific goal, such as a DST project. It was agreed that they would discuss this further with Joydeep and consider reaching out to Euro practice for assistance as suggested by Mrinal.

Increasing India's Engagement With IMEC

Shub and Sayan discussed strategies to increase India's engagement with IMEC, including involving Laudeand Barun Dutta. IMEC asked JU to identify at least one PG student for an internship at IMEC Belgium which Sayan has provided. Sayan committed to writing an email to Santanu requesting his assistance in engaging Laude and Barun, besides Arindam. Lastly, they discussed the availability of hardware boards at the IoT and Embedded lab and the release of the Synopsys purchase order, with a focus on the impact on training programs. Amit clarified that each machine should have Synopsys installed separately but should run on a shared license. Shub asked Sayan to document Soham's installation process for continuity beyond his graduation.

Project Validation and Faculty Pool Challenges

Shub, Sayan, and Amit discussed the need for project validation by the licensing team or Synopsys side, with Amit agreeing to review the project. They also addressed the challenges of creating a faculty pool for training, considering the use of adjunct faculty (identified first and then requested via the HoD office) to conduct courses. Sayan and Shub discussed the process for appointing adjunct faculty and the potential for these individuals to offer courses (approved via VC office). Shub proposed two potential areas for fundraising: creating student scholarships and setting aside a budget for hiring adjunct faculty. The possibility of existing faculty conducting external training

courses was also agreed upon to fulfill commitment towards Synopsys (JU as a India East nodal center) as well as to raise some operations revenue to hire IT staff for labs and program managers.

Technical Bid and University Procurement Changes

Sayan discussed the upcoming submission of a technical bid for 16 plus 2=18 computers, which was likely to trigger a financial approval process initiated by the finance office. Shub requested regular updates on this process to ensure there were no delays. Sayan also highlighted changes in the university's purchasing procedure, with purchases above one lac now requiring E tendering, and proposed that third-party entities could manage university procurement to bypass the tendering process. Shub agreed with this idea, suggesting it could be a more streamlined solution - Alumni buying from outside and donating goods rather than money going forward. However, it was recognized that this was not a straightforward proposal for GJUAF due to lack of manpower.

Analog Design Project and IoT Hardware

Sayan and Shub discussed the need for a breakout session to understand the technical requirements for Joydeep's analog design project using 180 nanometer TSMC PDK. They explored the possibility of using Global Foundries or IMEC as alternatives, with the potential for test chip fabrication support. Shub mentioned plans for Sheli and others to visit Bangalore for SNUG where multiple students' papers have been accepted for 2024. Sayan raised the need for a structured plan to utilize the available IoT hardware boards for training and solution development.

Addressing Faculty Leadership and Student Engagement

Shub and Sheli discussed the lack of faculty leadership and the gap in guidance for their students for the IoT projects. They expressed concern about the lack of interest among undergraduate and postgraduate students in their domain, with Sheli noting that active students were more engaged in other labs like SNPS to quickly work and publish papers. They identified the need for a product-type architect to guide the students. Shub suggested that the focus should shift from the AI/ML part alone to resolving some current issues using end-to-end IoT solutions which will require external mentoring in the first phase. UTL team (ex-students from JU) was proposed to be engaged along with Sibendu and Shub to guide the Water project which was submitted as a proposal for a DST call. Sayan proposed that students might be more interested in short-term goals like publishing papers.

Addressing IoT Challenges and Solutions

Sayan and Shub discussed the challenges encountered in the IoT lab, particularly in the areas of firmware, optimization, and hardware implementation. Shub stressed the need for a clear concept of IoT product development and the importance of understanding the different parts that work together. He proposed starting with a hands-on project involving a team of specialists from various fields, including hardware and software, to tackle more complex IoT problems in the future. Sayan agreed,

suggesting starting with small projects to build up a pool of data and products, with the potential to scale up to larger projects in the future. Prof Pankaj Roy from the Water resources engineering department has paid projects to collaborate with IC-COE. This was decided to be the starting project for students to get engaged.

Team Collaboration and Student Involvement

Shub offered his assistance to the team, particularly in the architecture and project proposal aspects. Sayan agreed to identify a problem statement for the project, with Shub and Sibendu offering to provide mentorship and engage their student resources to build the solution architecture and assign specific tasks to the students. The team also discussed the importance of having students work on real projects to gain practical experience and enhance their resumes. Shub encouraged the recruitment of students from other departments, such as mechatronics or instrumentation, to bring in cross-domain knowledge and perspective.

NOTE: A lot of progress has happened in the infrastructure procurement part including software licenses both from SNPS as well as the C2S recognition of JU offering CDAC licenses.

Additionally, a lot of engagement is noticed in the Digital VLSI lab. Engagement on internships, and projects with HCL, SNPS has started.

More areas and active work needs to happen.