Information about how to do a SLAM – Project / Product

Supervisor / Mentor / Reviewer

Supervisor is responsible for assigning a SLAM project and providing guidance and support to the students in order to help them achieve their project goals. A supervisor can be at a company or IARE. Reviewer can be from industry / company.

Dean of SLAM Centre / Evaluator

Responsible for scheduling / evaluating the student's work and determining if it meets the standards and requirements set by the institution or department. The Evaluator's role is to assess the student's performance and provide a fair and impartial evaluation of the project.

Learning Outcomes

On completion of the project, the student should be able to:

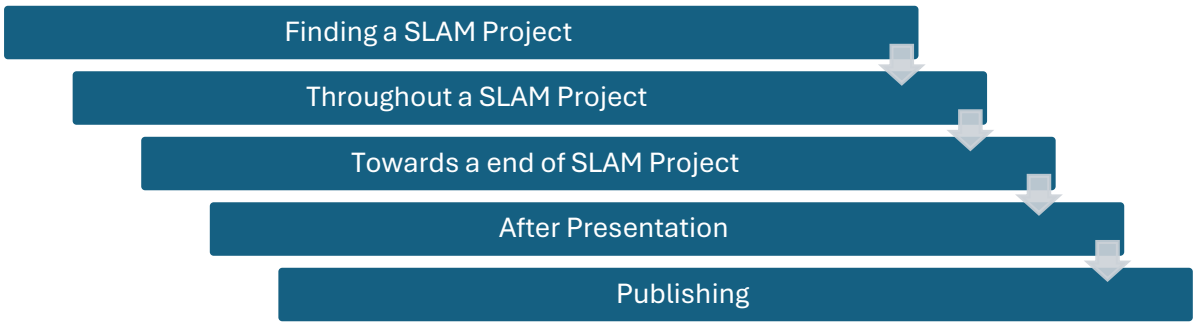
- show a deep knowledge within the chosen field of study
- search and in a critical way interpret and compile relevant scientific literature
- in a creative way delimit a scientific problem, plan a scientific study, choose appropriate methods, carry out the study, interpret and evaluate the results and, if applicable, generate a hypothesis to explain the observations all within given time frames
- present the results in correct language for different target groups both in scientific and in popular form
- give constructive criticism on texts within the study field

Industry frequently see SLAM reports as internships, but that's not the view of the Institute. In particular, goes beyond a simple internship. That doesn't necessarily mean that an internship can't form the basis of a SLAM project, but it is not enough.

A good way to make clear both to yourself and to the reviewer that you are doing a scientific study is to write one or more clear research questions in the SLAM project proposal, i.e. questions that should be answered by the project and where the answers give new knowledge.

SLAM Process

The process consists of the following steps as detailed below and summarised here.



1. Finding a project

Internally

Student should take the responsibility for taking ownership of the project, working diligently to complete it, and ensuring that it meets the academic standards and requirements set by the institution or the academic program. The student should demonstrate initiative, critical thinking, and problem-solving skills throughout the project. The SLAM project should build on what the student have already learned.

The head of the department conducts research presentations in the following research areas:

- Cornerstone Projects (CoPs)
- Side Projects (SP)
- Software Engineering / Software Design Projects (SDP)
- Fundamental AI (FunAI) Projects
- AI Agents
- Summer Research Internships (SRI) Projects
- Engineering Design and Development Projects (EDP)
- Technology Innovation and Product Support (TIPS)
- Vertically Integrated Projects (VIPS)
- Projects in Community Services (PICS)
- AI in Software Development Life Cycle (AI in SDLC) Projects

Students can read more about it on the IARE Samvidha – SLAM projects weblink. If you are interested in an advertised SLAM project in the department at the institute, prepare a White Page (click for format) to the head of the department or get in touch with the Dean of SLAM by email, phone, or in person.

Be prepared in taking initiative and anticipating what needs to be done before it's even asked of you. Don't wait for instructions; instead, actively seek ways to contribute and make a difference. Be ready to dive in with enthusiasm, knowledge and skills relevant to the project's objectives.

Furthermore, think deeply about how you are a good fit for the project. Consider your unique strengths, experiences, and passions that align with the project's goals.

Demonstrating your genuine interest and how you can add value will increase your chances.

Externally
If you are interested in a SLAM project in another department, another institute / University (domestic / abroad), or a company, make sure you have a CV and cover letter ready for submitting a project plan (click for proforma).

It is the responsibility of the student to find a suitable SLAM project. Please start applying for projects early as responses to Dean of Professional Training and Internship (PTI) from a supervisor / handled are at a company or university may take some time.

Please note that not all external projects are suitable for Capstone projects. First and foremost, projects should be relevant to the branch of study, the student is a part of. Projects primarily involving implementation (program design/coding/testing/debugging) work are not generally acceptable (although sometimes an implementation project can be made acceptable by including suitable design issues).

2. Throughout the project

Attend all scheduled meetings as announced by the Dean of SLAM / reviewer.

Submit written parts of the report so far before each meeting corresponding to your progress. Keep the subject reviewer informed on how the project progresses.

Advice on writing

- The written report is very important. Consider that your report will be used as a personal merit and will be evaluated based on the metrics (click here).
- Start the writing process early. Don't leave it till the end, but do it continuously. It takes 15-20 days to write a good report.
- Remember that good language is important. The quality of the language is a learning outcome in the course so your report could be rejected due to bad language.
- The use of ChatGPT and other Large Language Model (LLM) Applications to write your report is left to the discretion of the examiner. Consult head of the department first before you use them.
- There are no rules about the size of a report, but a report shorter than 30 pages is probably incomplete. A report of 60 pages or more probably contains too much code or similar. In other words, a normal report is around 40 pages. Consult your head of the department / reviewers if you have further questions.
- For LaTeX templates, you can use the template provided by Dean of Content Delivery and Publishing webpage.
- Click here for the document that contains advice for a SLAM project report preparation.

3. Towards the end of the project

Submit a draft version of the report to the supervisor / reviewer (normally two-three weeks) before the scheduled presentation date. An opponent will be assigned to you as well once a presentation is scheduled.

The finished version of the report will be sent to the assigned opponent and the examiner no later than a week before the scheduled presentation.

4. After presentation

Prepare the final version of the report based on feedback given during the presentation. Send the final version of the report to the supervisor / reviewer for final approval.

5. Publishing

When you've done with final presentation, you should publish the written report to IARE Samvidha.

First you need to create a serial number for the front page.

Then you can upload the final version of the report to Samvidha. In case the problem statement is provided by industry or If the SLAM project needs secrecy or a delayed time for publishing the report shall be archived but not published in Samvidha.

The SLAM project is more likely to be published in conference proceedings than in journal titles.

Questions & Answers

Q1: What counts as a problem/application area?
In case of an applied project, any application area is ok as long as it requires advanced computational methods.

Q2: Must the topic of the SLAM project be clearly connected to a course in the programme?
No, it does not have to, as long as it concerns.

Q3: What does "large and/or complex data" mean, by the way?
Any data that requires the application of advanced data science methods to solve the problem at hand. A database with 1000000 records is neither large nor complex.

Q4: What are Cornerstone Projects?
Cornerstone Projects (CoPs) are semester-long, team-based academic projects typically offered in the second or third year of undergraduate study. They are designed to give students real-world, hands-on experience in solving open-ended problems under faculty guidance.

Q5: What are Technology Innovation and Product Support?
At the forefront of technology institute foster innovation, entrepreneurial thinking and develop future-ready students capable of adapting to a rapidly changing world across a range of digital and engineering careers.

Q6: What are Vertically Integrated Projects?
Vertically Integrated Projects (VIP) involve design/discovery efforts involving students, researchers and faculty in their areas of expertise. VIP projects ambitious and long-term. Working together productively in a diverse team to find creative

solutions to the problems or to make progress on a project is a key employability skill in the 21st century.

VIP teams are:

- **Multidisciplinary** – drawing students from all disciplines on campus.
- **Vertically integrated** – a mix of B.Tech students starting from III semester, M.Tech students and research scholars.
- **Long Term** – each student may participate in a project for up to two / three years.

Q7: What are Projects In Community Service ?

The engineering projects in Community Services, is a social entrepreneurship program. Students design, build and deploy systems to solve engineering-based problems for charities, schools and other not-for-profit organizations. IARE students while, studying make a difference—they are tackling real-world problems today. These projects focus on four themes:

- Community Development
- Education
- Health
- Sustainability

Q8: What are AI in Software Development Life Cycle Projects ?

Artificial Intelligence in the Software Development Life Cycle (AI in SDLC) involves applying AI techniques to automate and optimize activities such as requirements analysis, coding, testing, and maintenance. It enhances software quality, efficiency, and decision-making throughout the development process.

Q9: What are Side Projects ?

A Side Project (SP) is an independent project that a student work on outside of your primary responsibilities. Side projects are often started to explore personal interests, build skills, or work on something creatively fulfilling without the constraints of routine academic settings. These projects provides an opportunity for hands-on learning, creativity, and personal growth, and they often become valuable additions to a portfolio or resume. It covers multiple areas of technologies from hardware to software and client-side apps to backend cloud services.

Q10: What are Software Engineering / Software Design Projects ?

The Software Engineering / Software Design allow the students to apply engineering principles, design practices, and technical skills to create well-structured, functional, and reliable software solutions. These projects are valuable in both academic and professional contexts, as they develop competencies needed for real-world software development.

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