2nd Digital India RISC-V (DIR-V) Symposium - 2025

DIR-V Symposium Hackathon

Track: FPGA Based

Objective

- To promote SHAKTI SoC's adoption in automation, logistics and industrial applications.

Mode of Participation : Hands-on

FPGA will be provided at the hackathon venue. FPGA will be either Arty7 100T or Nexys Video.

Take Away for Participants:

- Gain hands-on experience in integrating SHAKTI based SoC.
- Learn and appreciate building products based on SHAKTI SoC.
- Understand the Memory maps that dictate how different peripheral components will access memory resources within the SoC.
- Develop software development kit.

Who can Participate

Individuals or teams can participate in any one of the hackathons. Participants should be

- Student of any Indian university or College
- Startups registered under DPIIT

Maximum of 25 registrations for each hackathon based on first come first serve basis. The size of each team can be a maximum of three.

Pre-requisites

- Basic Electronics and Microcontrollers, Understanding of FPGA, sensors, actuators.
- Protocols: I2C, GPIO,UART, SPI,PWM.

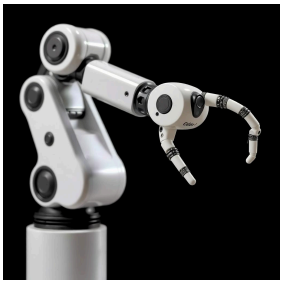
Webinar for the participants will be held on how to build SHAKTI SoC and generate bit streams for an FPGA and about Software Development Kit.

Post-Hackathon Opportunities

Winners will be offered internship/project opportunities in the DIR-V Industry and Academia Ecosystem

Problem Statement - 1: Robotic Sorting Arm

Utilizing the SHAKTI SoC, develop a robotic sorting arm designed to categorize red, blue, and yellow balls into distinct bins. The robotic arm will retrieve a ball from a collection bin containing these colored balls, identify its color, and then place it into the corresponding bin designated for that specific color.

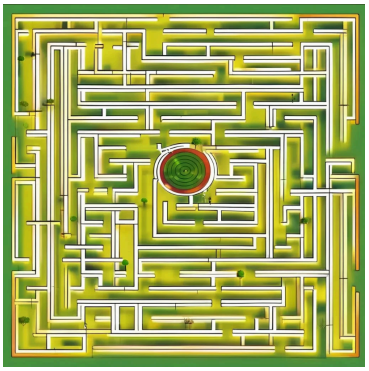


Evaluation Criteria:

- Minimum number of joints / movements.
- Sorting speed.
- Customization and size of RTL.
- Size of Firmware.

Problem Statement - 2: Maze Game

Using the SHAKTI SoC, create a rover capable of navigating a maze by avoiding obstacles and finding a path to its destination. A sample image and dimensions will be provided one month prior to the event.



Evaluation Criteria:

- How soon the maze is solved.
- Customization and size of RTL.
- Size of Firmware.
- Cost of implementation.