Sunya Lab

Centre for Advanced Computing and Communication

Rajagiri School of Engineering & Technology, Kochi

**About Sunya Lab :**

The Sunya Lab, part of the Centre for Advanced Computing and Communication at RSET, is dedicated to conducting fundamental research in the vast fields of computer science and artificial intelligence. The lab is firmly committed to taking a leading role in both pioneering new theoretical approaches and developing applications that can make a significant societal impact.

Currently, Sunya Lab's research activities are concentrated in three primary domains:

1. Artificial Intelligence & Data Science: In this research area, the lab strives to comprehend and create systems, whether living organisms or artificial constructs, that possess the ability for intelligent reasoning, perception, and behavior. Specific research endeavors encompass core AI, computational biology, computer graphics, computer vision, human language technology, machine learning, medical informatics, robotics, and the semantic web.

2. Systems: Sunya Lab's research in this domain seeks to uncover fundamental principles, models, metrics, and tools that apply to computer systems, encompassing both hardware and software aspects. This research delves into areas such as compilers, computer architecture and chip design, operating systems, programming languages, High Performance & Distributed Computing and computer networks.

3. Theory: Within the realm of theory, Sunya Lab investigates the mathematical aspects of computation and the implications they carry. Specific research areas encompass algorithms, complexity theory, computational geometry, cryptography, distributed computing, information security, and quantum computing.

The lab actively encourages student involvement in its research projects, offering opportunities for undergraduates to participate through internship programs and providing research assistantships for graduate students.

In addition to that the lab provides High Performance Computing support to other fields of Engineering and Sciences to accomplish their computational objectives.

**Computational Resources:**

Refer - <https://www.rajagiritech.ac.in/home/Centres/sunya.asp>

**People** :

* Will share later

**Interns** :

* Will share later

**Student Projects** :

* Will share later

**Funded R&D Projects** :

* Will share later

**Consultancy Services :**

* Will share later

**Events :**

* Will share later

**Workshops :**

* Will share later

**Courses :**

* Will share later

**Call for Interns**

Sunya Lab, the Center for Advanced Computing and Communication, is a research and consultancy lab at Rajagiri School of Engineering & Technology in Kochi. The lab's primary focus is to provide industry solutions through R&D-based projects and proof-of-concept (PoC) prototypes.

Currently, we offer internship positions to highly motivated undergraduate students in their third and fifth semesters pursuing degrees in CSE, AIDS, CSBS, IT, and ECE at Rajagiri School of Engineering & Technology.

**Area of Internships:**

1. A generic Data Analysis and Analytics Platforms
2. Design and Development of AI models for Resource Constrained Hardware
3. Web Frameworks, Micro Services and Containerization
4. Drivers to analyze executables using CPU Performance Monitoring Counters
5. Tiny AI models for FPGA
6. Software Defined Firewalls

**Duration of Internship:**

1. One Academic Year
2. Hybrid mode

**Who Can Apply?**

* Good C Programming skills
* Sem 3 and Sem 5 students in CSE, AIDS, CSBS, IT, and ECE at RSET

**Selection Procedure**

* GitHub Contributions
* Technical Interaction/Test on core computing science/computer architecture areas

**Number of Interns**

* Sem3 : 10nos
* Sem5 : 10nos

**Participation in the Train the Student Trainer Program, some of the proposed programs are**

* Introduction to Cirq: an open-source framework for programming quantum computers
* System Administration and Workload Parallelization in High-Performance Computing
* Deployment of Private Cluster / Grid / Cloud Systems
* Building a minimal compiler for MIPS architecture
* Demystifying Linux Operating System Kernel
* Software Defined Networks
* Deployment of Blockchain
* Computer Vision based AI deployment in a Real-Time Surveillance System
* Ethical Hacking
* Deep Fake Forensics
* Exploring perf utility to fine-tune executables on Linux Platforms
* Multi-threaded programming to design your own libraries focusing on performance and optimization in CPU/GPU/Hybrid systems
* Introduction to Generative AI

**Benefits:**

* Access to Sunya Lab Resources
* Participation in events organized by Sunya Lab
* Opportunity as a trainer for STEM outreach events / RSET Level Training Programs
* Participation in funded R&D and Industry Consultancy services
  + Kochi Metro
  + Cochin Smart City Mission Ltd
* Hands-on Experience in Industrial Tools and Technologies beyond academics

**Contact :**

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