

# **Two day National Workshop on Mathematical Foundations of Cyber Physical Systems**

## **Organized by**

Centre for Research in Mathematical Sciences,  
St. Joseph's College (Autonomous), Irinjalakuda



## **Speakers**

Prof. Krisha Sankaranarayanan

Professor

Department of Computer Science and Engineering

IIT Bombay

Dr. Bijoy Antony Jose


Assistant Professor


Department of Electronics, CUSAT

(Principal Consultant, Pumex Infotech)

# BROCHURE

**NATIONAL WORKSHOP  
ON  
MATHEMATICAL FOUNDATIONS OF  
CYBER PHYSICAL SYSTEMS**  
**13, 14 FEBRUARY 2020**

  
*In Honour of Our beloved Principal*  
**Dr. Sr. Isabel**



*Organized by*  
**DEPARTMENT OF MATHEMATICS  
St. Joseph's College (Autonomous)  
Irinjalakuda**

*Supported by*  
**AUTONOMY CELL**

### About the Workshop

Cyber-Physical Systems (CPS) are integrations of computation, networking, and physical processes. The increasing synergy between computation techniques and physical mechanisms results in a rapid development of cyber-physical systems (CPS), which integrates computation and communication aspects together with control and monitoring techniques. Automata theory plays a major role in the modelling perspective of CPS systems. Through the workshop we would like to give an overview on mathematical foundations of CPS and its applications

### *Resource Persons*



**Dr. Krishna Sankaranarayanan**  
Professor,  
CSE, IIT Bombay



**Dr. Bijoy Antony Jose**  
Principal Consultant, Pumex Infotech &  
Assistant Professor,  
Department of Electronics, CUSAT

### PROGRAMME

#### Day 1 – 13/02/2020

10:00 AM - Inauguration

10:30 AM – **Session 1**

**Cyber Physical System:  
Applications in security**

12:00 PM – Lunch Break

1:00 PM – **Session 2**

**Introduction and Motivation  
for Verification.**

3:00 PM – High Tea

#### Day 2 – 14/02/2020

10:00 AM – **Session 3**

**Logics to formally specify  
properties of systems**

12:00 PM – Lunch Break

01:00 PM – **Session 4**

**Formal Verification/Model-  
Checking & relevance of it**

03:00 PM – Tea Break

03:15 PM- Valedictory

**Convener :** Ms. Sherin Jose T

**Executive Committee :** Sinda Joy, Dhanya V. S., Dr. Deemi C. J., Dr. Fijoy Jose P.,  
Alphy Joseph, Baby A. K., Sonadas P, Anju Davis, Mary Pauly

For registration : 9725474495, mathematics@stiossrbds.edu.in

# BANNER



# CERTIFICATE



# ACADEMIC REPORT

A Two day National Workshop on Mathematical Foundations of Cyber Physical Systems was organized in St. Joseph's College (Autonomous) Irinjalakuda, Kerala on 13/02/2020 and 14/02/2020 with a view to build an outline of the designing methodology of CPS among students and teachers. Fifty students of different colleges were participated in the programme.

## INAUGURAL SESSION

The two day National Workshop was inaugurated in the Seminar Hall, St. Joseph's college (Autonomous) Irinjalakuda by Dr Krishna Sankaranarayanan, Professor, Department of Computer Science & Engineering, IIT Bombay, The programme was presided by Dr. Sr. Isabel (Principal, St. Joseph's College, Irinjalakuda) and Ms. Sherin Jose T (Head, Department of Mathematics, St. Joseph's College, Irinjalakuda) offered a formal welcome. Dr.Rani M.J (Former Head, Dept. of Mathematics, St. Joseph's College, Irinjalakuda & Vice Principal, Sahrdaya College of Advanced Studies) felicitated the occasion and the inaugural ceremonies ended up with the vote of thanks of Ms Sinda Joy (Assistant Professor, Dept. of Mathematics ).



## REPORT OF COURSE IN BRIEF

Dr. Bijoy Antony Jose

Assistant Professor  
Department of Electronics,  
CUSAT  
(Principal Consultant,  
Pumex Infotech)



**Day 1 (13/02/2020)**

**Session 1 ----Time 1.30 hrs**

Topic: Cyber Physical System: Application in security  
Embedded system, Transdisciplinary approaches, Latest innovations and research developments using cyber physical systems

Prof. Krisha Sankaranarayanan

Professor  
Department of Computer  
Science and Engineering  
IIT Bombay



**Day 1 (13/02/2020)**

**Session 2---- Time 1.00 – 3.00 P.M**

Topic: Introduction and Motivation for Verification  
Discussion on how can the solution of the problem be valuable

**Day II (14/02/2020)**

**Session 3--- Time 10.00 -12 P.M**

Dr. Krisha Sankaranarayanan

Professor, Department of Computer Science and Engineering  
IIT Bombay

Topic : Logics to Formally specify properties of systems

- Logical calculus
- Axiomatic system

**Day II (14/02/2020)**

**Session 4--- Time 1.00 -3 P.M**

Dr. Krisha Sankaranarayanan

Professor, Department of Computer Science and Engineering  
IIT Bombay

Topic : Formal Verification/ Model-Checking & Relevance of it.

- Finite-state model
- Propositional logic



## VALEDICTORY SESSION

In the **valedictory session** the participants from all colleges shared their experience and Ms Alphy Joseph proposed formal Vote of thanks. Certificates were distributed by the end of the programme. The programme concluded with Tea.



# PARTICIPANTS LIST

Registration for the National Workshop on Mathematical Foundations of Cyber Physical Systems on  
13th and 14th February 2020

Sl.No	Name	Designation	Name of the Institution	Signature
1	LINSA THOMAS	1 <sup>st</sup> year MSc Mathematics	Sacred Heart College Chelakudy	
2	Saba M S	"	"	
3	SARANYA K P	1 <sup>st</sup> Year M.Sc. Mathematics	S.N. College, Nattin	
4	Saly. A R	"	"	
5	ANIYANA P S	"	"	
6	BRIDHU T.M	1st year MSc Mathematics	Sacred Heart College Chelakudy	
7	VISHNUPRIYA K	II <sup>nd</sup> year MSc Mathematics	Christ College Irinjilakuda	
8	NITHA C V	"	"	
9	MEGHA T M	"	"	

Sl.No	Name	13/02/2020		14/02/2020	
		FN	AN	FN	AN
1	ALIDA ANTO				
2	ANITA ANTONY				
3	ANIYANA JOHNY				
4	ANU C S				
5	ARCHANA P S				
6	ASHADHY K C				
7	FENNY TOMI				
8	GOURISHYNA C R				
9	JEESSA JOJO				
10	JILA GEORGE				
11	JOVITA ANTONY V				
12	KRISHNANDU BALU				
13	MARIN ANTO				
14	NAR ARULITHA MOHANLALAN				
15	NIRSHY THERESA BABU				
16	NITHA P J				
17	RESHA E V				
18	SIVAPRINA V S				
19	SHEELAKSHYA T S				
20	THASHEEM P T				
<b>2nd PG</b>					
1	ANGEL JOSE				
2	ANGIE ANTONY K				
3	ANUSA K S				
4	APOORVA JOSEPH				
5	DEEPIKA SURIYANMARAN				
6	FATHIMA SARIN M K				
7	GREENA ROY P				
8	JUTHA JOY				
9	JACY K G				
10	JOTHY E N				
11	KRISHNARACHANA M G				
12	LAVISHA A J				
13	LAVISHA A J				
14	MICHA P S				
15	MIRU N USAYAN				
16	NIKHITA JOHNY				
17	SADESA SHARY A J				
18	SIMY CHEERAN				
19	SORINA M J				
20	VARSHA K R				
21	VARSHA K S				
22	Krishnakshi (Ramesh Babu)				

Sl.No	Names	13/02/2020		14/02/2020	
		FN	AN	FN	AN
<b>1st PG(CS)</b>					
1	ANGEL SHIBU				
2	EMIL BABU				
3	JITHA JOY A J				
4	KRISHNA V S				
5	NEENU P A				
6	NIFA N J				
7	SANA SHAMSUOHEEN				
8	SREELAKSHMI C				
9	UNNIMAYA V S				
<b>2nd PG(CS)</b>					
1	ANAGHA P A				
2	ANIYANA SEBASTIN				
3	REJITHA K R				
4	BIZMOL P G				
5	SNEHA C S				
6	SHILVI WILSON NEELANKAVIL				
7	STEPHY DAVIS				
8	SURUMI P S				
<b>Outside Participants</b>					
1	LINSA THOMAS				
2	SNEHA M S				
3	SARANYA K P				
4	SALY A R				
5	ANIYANA P S				
6	BRIDHU T M				
7	VISHNUPRIYA K				
8	NITHA C V				
9	MEGHA T M				