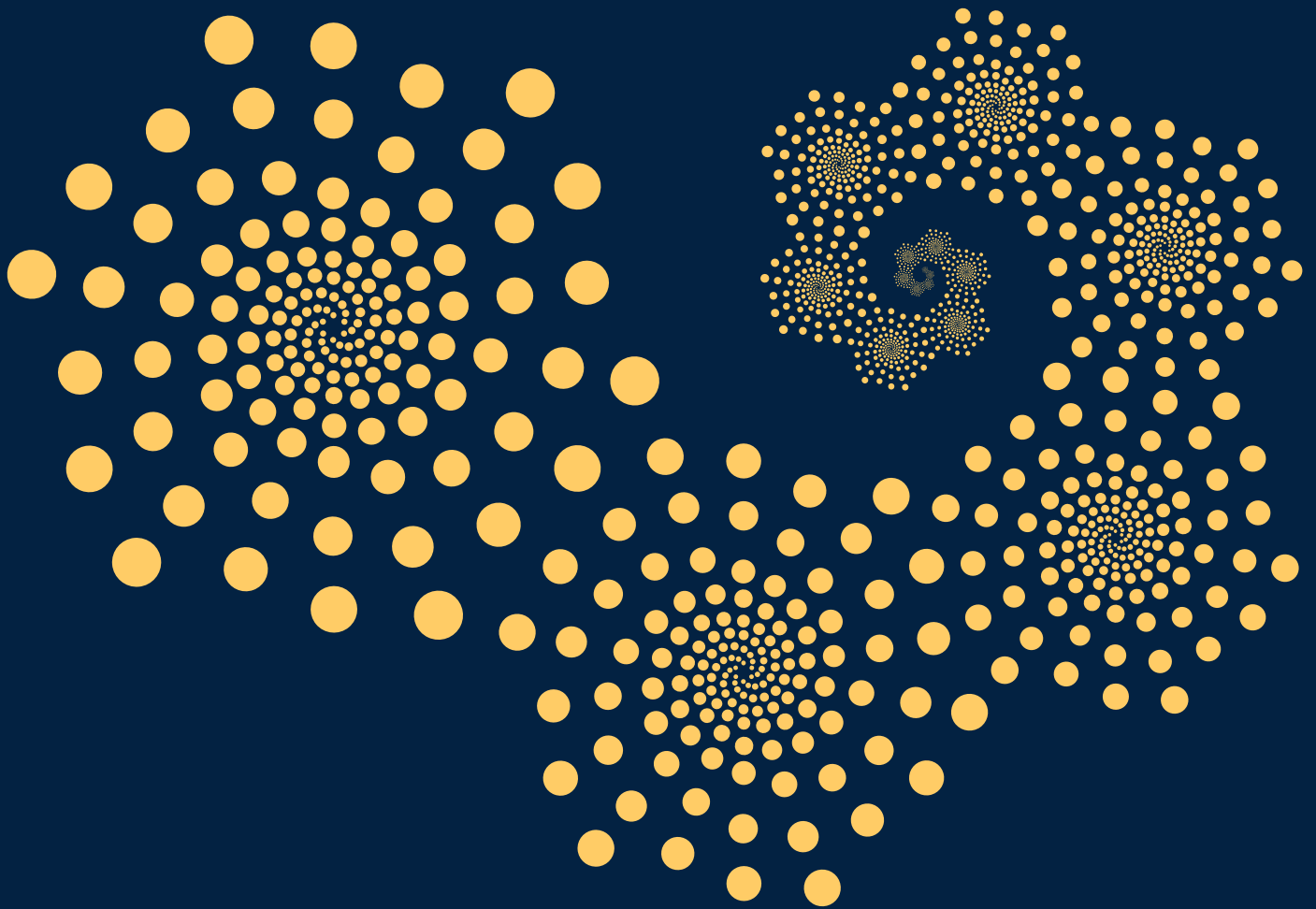


Computer Science and Engineering  
Indian Institute of Technology Kanpur



**55<sup>th</sup> CONVOCATION**

**29<sup>th</sup> June 2022**

**Dept. Convocation Brochure and Head's Report**

## Head of Department

Dr. Mainak Chaudhuri

## Faculty Members

Dr. Amey Karkare (P)  
Dr. Amitangshu Pal (AP)  
Dr. Anil Seth (P)  
Dr. Arnab Bhattacharya (P)  
Dr. Ashutosh Modi (AP)  
Dr. Debadatta Mishra (AP)  
Dr. Debapriya Basu Roy (AP)  
Dr. Hamim Zafar (AP)  
Dr. Indranil Saha (AsP)  
Dr. Jithin K Sreedharan (AP)  
Dr. Mainak Chaudhuri (P)  
Dr. Manindra Agrawal (P)  
Dr. Nisheeth Srivastava (AsP)  
Dr. Nitin Saxena (P)  
Dr. Piyush Rai (AsP)  
Dr. Preeti Malakar (AP)  
Dr. Priyanka Bagade (AP)  
Dr. Purushottam Kar (AsP)  
Dr. Raghunath Tewari (AsP)  
Dr. Rajat Mittal (AsP)  
Dr. Rajat Moona (P)  
Dr. Sandeep Kumar Shukla (P)  
Dr. Sanjeev Saxena (P)  
Dr. Satyadev Nandakumar (AsP)  
Dr. Subhajit Roy (AsP)  
Dr. Sumit Ganguly (P)  
Dr. Sunil Simon (AsP)  
Dr. Surender Baswana (P)  
Dr. Sutanu Gayen (AP)  
Dr. Swarnendu Biswas (AP)  
Dr. Urbi Chatterjee (AP)

## Emeritus Fellow

Dr. T. V. Prabhakar

## Visiting Faculty Members

Dr. Arvind Verma (Indiana U.)  
Dr. Gaurav Sharma (TensorTour)  
Dr. Nisheeth K. Vishnoi (Yale U.)  
Dr. Prateek Jain (Google Research)  
Dr. Ponnurangam Kumaraguru (IIITH)

## Engineers

Brajesh Kumar Mishra (Tech. Supt.)  
Nagendra Yadav (Tech. Supt.)  
Saurabh Malhotra (Senior Technician)  
Meeta Bagga (Senior Technician)  
Shweta Sachan (Junior Technician)  
Anil Kumar (Junior Technician)  
Akash Misra (Project Engineer)  
Nitin Kumar Singh (Research Establishment Officer)

## Office Staff

Prashant Kumar Sahu (Junior Superintendent)  
Rajesh Kumar (Deputy Project Manager)  
Ranjan Kumar (Assistant Project Manager)  
Amit Kumar Bharti (Project Assistant)  
Shivam Sharma

## Department Counsellor

Aradhana Yadav

### **Post Doctoral Fellows**

Dr. Inzemamul Haque  
Dr. Madhurima Mukhopadhyay  
Dr. Mahendra Rathor  
Dr. Mohammad Sultan Alam  
Dr. Oswald C.  
Dr. Pampa Howladar  
Dr. Rakesh Ranjan Swain  
Dr. Santosh Arvind Adimoolam

### **Former (Visiting) Faculty Members**

Dr. Adarshpal Pal Sethi  
Dr. Ajai Jain  
Dr. Amitabha Mukerjee  
Dr. Ansuman Banerjee  
Dr. Asish Mukhopadhyay  
Dr. B. Srinivasan  
Dr. Bhaskar Raman  
Dr. Biswabandan Panda  
Dr. C. R. Muthukrishnan  
Dr. Dheeraj Sanghi  
Dr. Gautam Barua  
Dr. H. N. Mahabala  
Dr. H. V. Sahasrabuddhe  
Dr. Harish Karnick  
Dr. Kesav Nori  
Dr. Kritika Venkatramani  
Dr. M. S. Krishnamurthy  
Dr. Medha Atre  
Dr. Nisheeth Kumar Vishnoi  
Dr. Pabitra Mitra  
Dr. Pankaj Jalote  
Dr. Phalguni Gupta  
Dr. Piyush P. Kurur  
Dr. Pramod Subramanyan

Dr. Prateek Jain  
Dr. R. M. K. Sinha  
Dr. R. Shankar  
Dr. Rajiv Sangal  
Dr. Ratan K. Ghosh  
Dr. Sanjay G. Dhande  
Dr. Sanjeev K. Aggarwal  
Dr. Shashank K. Mehta  
Dr. Shashank Singh  
Dr. Somenath Biswas  
Dr. Sumit Gulwani  
Dr. Swaprava Nath  
Dr. Tapas Nayak  
Dr. V. M. Malhotra  
Dr. V. Rajaraman  
Dr. Vinay P. Namboodiri  
Dr. Sunil Gupta

### **Former Post Doctoral Fellows**

Dr. Ayan Chakraborty  
Dr. Jubin Mitra  
Dr. Kripabandhu Ghosh  
Dr. Prema S  
Dr. Sankar Narayan Das  
Dr. Zeyu Guo

## दीक्षान्तोपदेशः

संस्मरन्तु भवन्तः भवदीयमिदं ज्ञानविज्ञानं राष्ट्रस्य पवित्रतमो निधिः। तस्माद् अस्योपयोगः स्वदेशस्य स्वशिक्षणसंस्थानस्य च गौरवानुरूपं सम्यग् विद्यातण्यः। कस्यामपि दशायां भवद्विः स्वकीया व्यावसायिकी मर्यादा, चारित्रिकी महत्ता च सयत्नं संरक्षणीये। मनसा, वाचा, कर्मणा च सर्वथा लोक कल्याणाय प्रयत्नीयम्। अनुशासनप्रियैः सदा भाव्यम्। स्मर्यताञ्च श्रुतेर्वचनम्

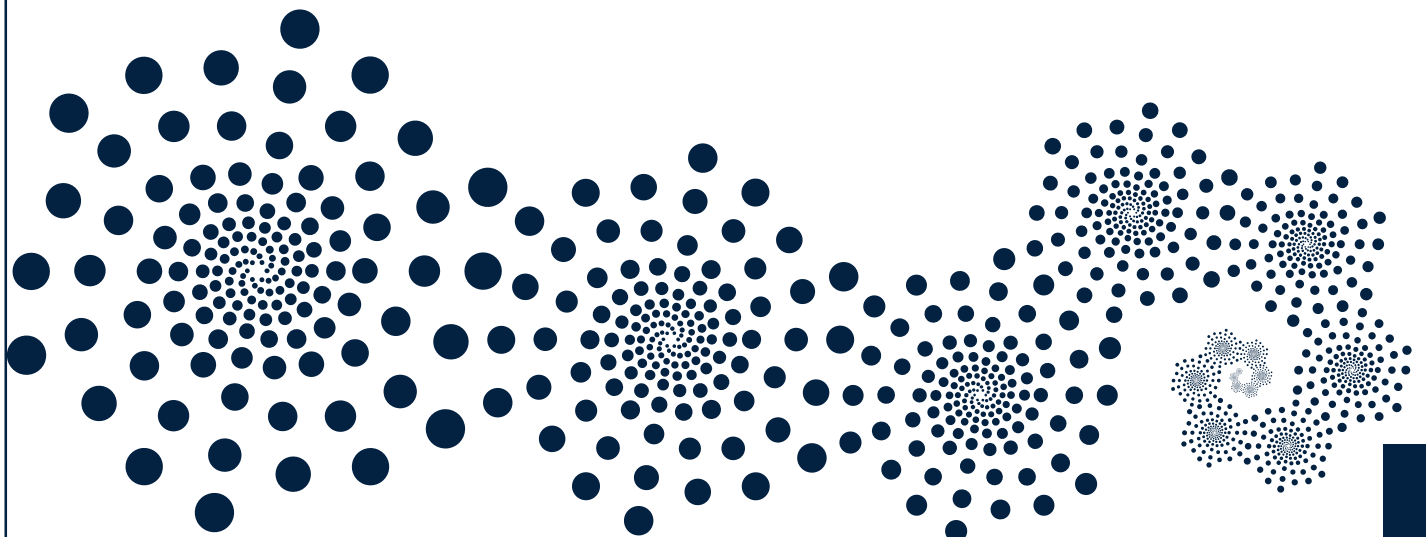
*“यानि अनवद्यानि कर्माणि तानि सेवितव्यानि नो इतराणि।”*

## EXHORTATION

Remember that your knowledge and intellectual attainment is the most sacred wealth of the nation. You shall therefore, use it in a manner befitting the honor and dignity of your country and of your alma mater. You shall make every effort, in all circumstances, to uphold the dignity of your profession and integrity of your character. You shall endeavor, in every way, through thought, word and action, to bring about the well-being of people. You must live a well-disciplined life. Never forget the commandment of the sacred scriptures:

*“Thou shalt perform deeds that are commendable and no others.”*

# Graduating Students 55<sup>th</sup> Convocation 2022



# DOCTOR OF PHILOSOPHY (PhD)

VIMAL RAJ SHARMA (15211264)

Supervisor: Raghunath Tewari

Thesis Title: *Catalytic Computation and the Even-Path Problem*

BHASKAR PRATIM MUKHOTY (16111262)

Supervisors: Purushottam Kar and Sandeep Shukla

Thesis Title: *Learning in the Presence of an Adversary: A Provable Approach*

GARIMA SHAKYA (17111264)

Supervisors: Swaprava Nath

Thesis Title: *Mechanism Design for Implementing Social Goals in Resource Allocation and Voting*

## JOINT DEGREE (Mtech – PhD)

SHUBHAM SAHAI SRIVASTAVA (12211063)

Supervisors: Sandeep Shukla and Pramod Subramanyan

Thesis Title: *Privacy-preserving Verification of Properties of Data and Formally Verified Security Guarantees*

PRATIK MAZUMDER (16111263)

Supervisors: Vinay P. Namboodiri and Piyush Rai

Thesis Title: *Data Efficient Techniques for Deep Learning*

# **MASTER OF SCIENCE BY RESEARCH (MSR)**

17111403 PRITI GAUTAM  
18111410 KALAN NITISH MANGESH  
18111411 PARUL KAPOOR  
18111412 PRIYA PUROHIT



## MASTER OF TECHNOLOGY (MTech)

15511265	GAURAV KUMAR	20111004	ADITYA JAIN
18111082	VIKAS KUMAR	20111006	AKASH HALAYYANVAR
19111001	AAKRATI JAIN	20111016	DEBANJAN CHATTERJEE
19111003	ABHAY RAJ YADAV	20111017	DEEKSHA ARORA
19111009	AMIT NEGI	20111023	VORA JAY PARESHBHAI
19111015	ANURAG MAITHANI	20111027	KOTHDIYA JAYKUMAR
19111020	AVESH KUMAR		JENTIBHAI
	AGRAWAL	20111028	KUSHAGRA PANDEY
19111055	GARALA NANCY	20111057	SHILPA CHATTERJEE
	RAMESHCHANDRA	20111060	BHATT SHREY
19111056	NAVEEN. M.V.		BHIKSHUKBHAI
19111080	SAURABH PANDEY	20111062	SHRUTI WASNIK
19111097	CHAUDHARI VAIBHAV	20111069	TANISHA RASTOGI
	JAYPRAKASH		

## DUAL DEGREE (Btech – Mtech)

14807167 AYUSH TULSYAN  
17807203 BALDIP SINGH BIJLANI  
17807239 DEVANSH SHRINGI  
17807648 SAYAK CHAKRABARTI  
17816710 SOMESH CHANDRA NEGI  
(CSE-ECO)

## BACHELOR OF TECHNOLOGY (BTech)

160508	PRAVAR DEEP SINGH	180372	KULDEEP RAJ ROHLAN
170260	DUMALWAD ANUP BALAJIRAO	180380	LAVISH GUPTA
180003	AAKANKSHA CHHAVI	180401	MANAS AGARWAL
180007	AARYAN SRIVASTAVA	180426	MOHD TALIB SIDDIQUI
180010	AASTHA SONI	180429	MOHIT MOHAN
180014	ABHAY	180450	MUTTINENI NITHYA
180017	ABHINAV SHARMA	180457	NAMAN BIYANI
180022	ABHISHEK MITTAL	180465	NAYAN MEENA
180042	ADITYA SINGH CHAUHAN	180475	NIKHIL AGARWAL
180058	AKHILESH SHARMA	180484	NIRMAL PRAVEEN SUTHAR
180060	AKSHAJ BANSAL	180489	NISHTHA
180074	AMAN TAYAL	180497	PANKAJ
180093	ANITA BUGALIA	180501	PARAS MITTAL
180094	ANJALI DEVRA	180511	PIYUSH RANE
180107	ANKUR	180526	PRAKHAR NEEMA
180139	ARPIT AGARWAL	180532	PRANATI MAJHI
180165	AVINANDAN BOSE	180539	PRASHANT KUMAR
180181	AYUSH VERMA	180559	PRIYANSHU AGARWAL
180200	BHUVNESH BAMORIYA	180580	RAHUL KUMAR TIWARY
180205	CHAUHAN DEV	180609	RISHABH KUMAR CHAUDHARY
180206	CHINMAY GOYAL	180629	ROHIT RANJAN
180207	CHINMAYA SINGAL	180635	RWIT PANDA
180218	DEBARSHO SANNYASI	180636	RYTHM AGARWAL
180226	DEEPANKUR KANSAL	180653	SAKSHI
180241	DHRUV ALPESH OZA	180664	SANCHIT AGRAWAL
180249	DIPESH KHANDELWAL	180666	SANDEEP SHARMA
180272	GUGULOTH VARUN	180669	SANJAY KUMAR
180274	GUNTAS SINGH BRAR	180674	SARTHAK DUBEY
180277	HARMANJOT SINGH	180675	SARTHAK KAPOOR
180305	INDRANIL MANDAL	180691	SHAILENDRA DOHRE
180313	ISHANH MISRA	180697	SHASHANK AGARWAL
180330	JAYESH SHAW	180703	SHASHWAT GUPTA
180334	K KRISHNA DHAKSHIN	180772	SOMU PRAJAPATI
180360	KORAPATI AKHIL RATNA	180782	SPANDAN SENAPATI

## **BACHELOR OF TECHNOLOGY (BTech)**

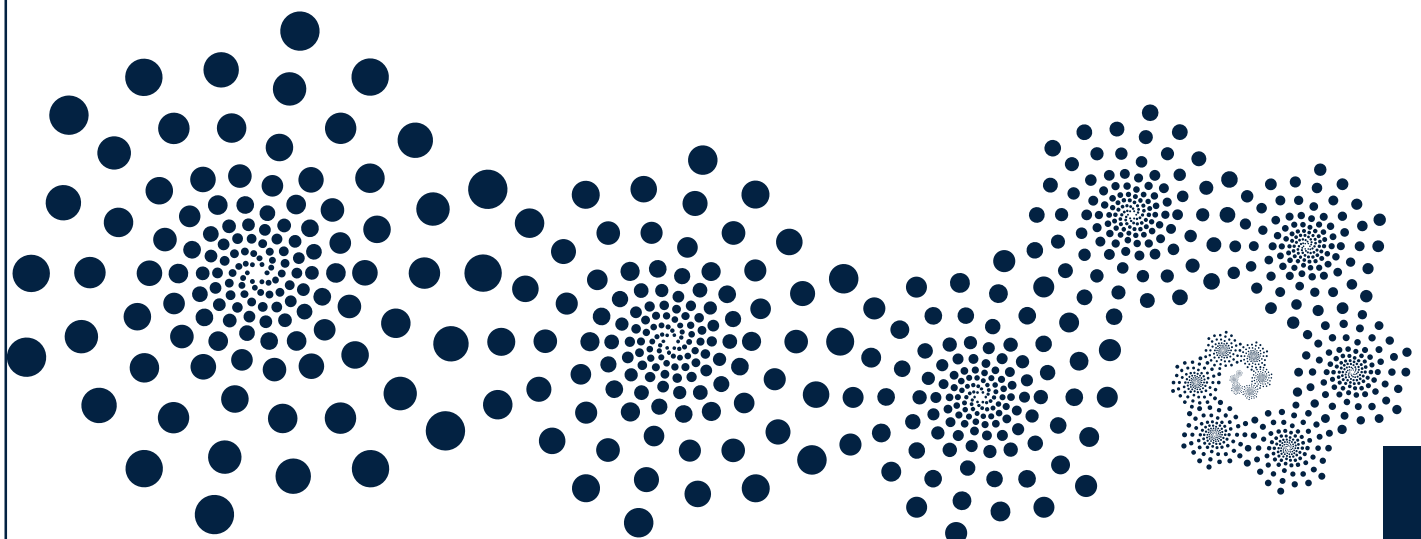
180789	SUDHANSHU CHAUHAN	180847	VARCHASV SHRI
180796	SUMIT JAISWAL	180850	VARUN GOYAL
180799	SUNIDHI DHANDHANIA	180876	VISHWAS CHOUDHARY
180801	SUPREETH BALIGA	180880	VIVEK KUMAR GUPTA
180805	SURAM NIVEDH	180894	YASHWANT TAILOR
180834	UMMADISETTY VENKATA PRANAV	180898	YUVRAJ
180845	VAIDIC JAIN	180899	YUVRAJ CHANDRAWANSHI
		180900	YUVRAJ GARG

## DOUBLE MAJOR (Btech)

170268	GARIMELLA MOHAN	170638	SATHVIK BHAGAVAN (ME)
	RAGHU (EE)	170805	VISHESH KAUSHIK (ME)
170822	YASHARTH BAJPAI (EE)	170174	ATHARV TYAGI (MTH)
170028	ABHISHEK MUGAL (ME)	170171	ASHUTOSH SHUKLA (PHY)
170296	HEMANT KEJRIWAL (ME)		

All students listed above got their second major in CSE. The department of their first major is indicated within the parentheses.

# **Awards and Honors 55<sup>th</sup> Convocation 2022**



# List of Awardees

## **PRESIDENT'S GOLD MEDAL**

*For the best academic performance among the graduating students of all disciplines in all the 4-year / 5-year undergraduate programmes*

180703      Shashwat Gupta

## **OUTSTANDING PH.D. THESIS AWARD**

*For the best thesis in Doctor of Philosophy programmes in each department*

16111263      Pratik Mazumder

## **GENERAL PROFICIENCY MEDAL**

*For the best academic performance among the graduating students of all 4-year/5-year and 2-year M.Sc. programmes in each of the departments*

180703      Shashwat Gupta

## **PROFICIENCY MEDALS**

*For the best undergraduate project work done by graduating students in the 4-year/5-year and 2-year M.Sc. programmes in each of the departments*

17807239      Devansh Shringi

17807648      Sayak Chakrabarti

180782      Spandan Senapati

## **RANJAN KUMAR MEMORIAL AWARD**

*For the best socially relevant project by any graduating student(s) of any department*

180450      Muttineni Nithya

## **CHANDRA PRABHA AND CHARAN DASS GUPTA GOLD MEDAL**

*For the best academic performance among all graduating female students in 4-year undergraduate program in any Engineering department*

180653      Sakshi

## **BEST SOFTWARE AWARD**

*For the best software developed by any graduating student or a group of students of any discipline*

170822      Yasharth Bajpai (EE-CSE)

## **PROFESSOR PUTCHA VENKATESWARLU MEMORIAL GOLD MEDAL**

*For the best academic performance among all the graduating 4-year undergraduate students*

180042      Aditya Singh Chauhan

## List of Awardees (continued)

### **RADHABAI VASUDEO NAVELKAR AWARD**

*For the best graduating girl student of the 2-year MTech programme in the Computer Science & Engineering department*

20111017      Deeksha Arora

20111057      Shilpa Chatterjee

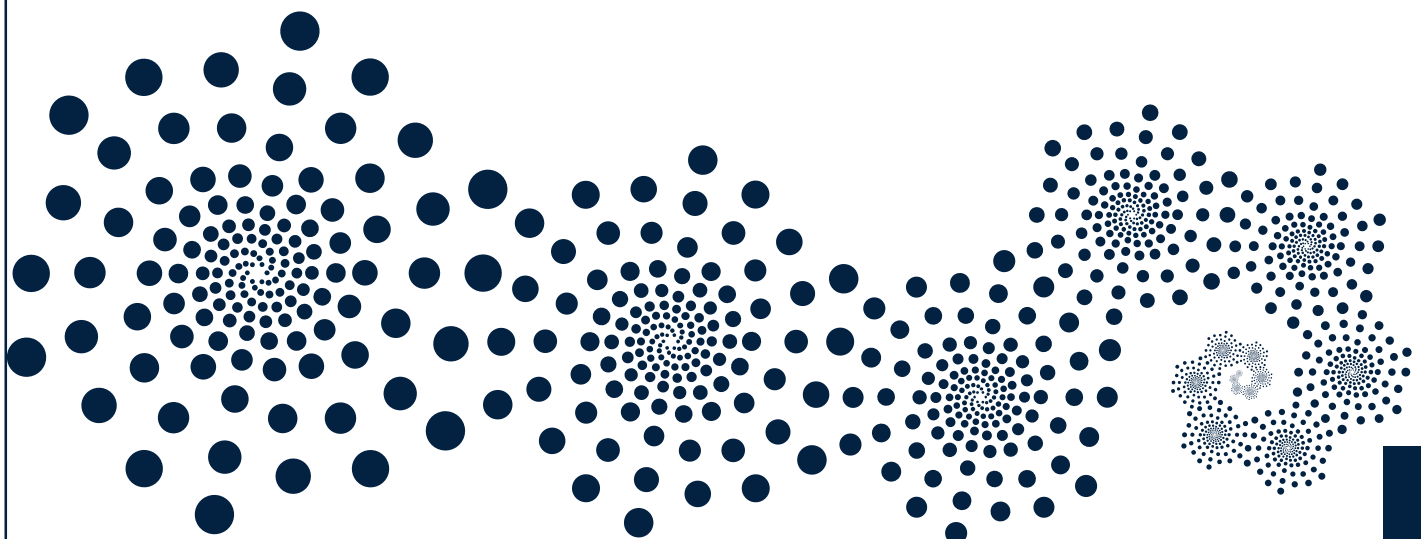
### **KANTA DEVI MALIK MEMORIAL AWARD**

*For the best academic performance among all graduating 4-year BTech girl students*

180653          Sakshi



# **Guest of Honor 55<sup>th</sup> Convocation 2022**



# **FIFTY FIFTH CONVOCATION**

## **29 JUNE 2022**

### **Guest of Honor for the Department of Computer Science and Engineering**

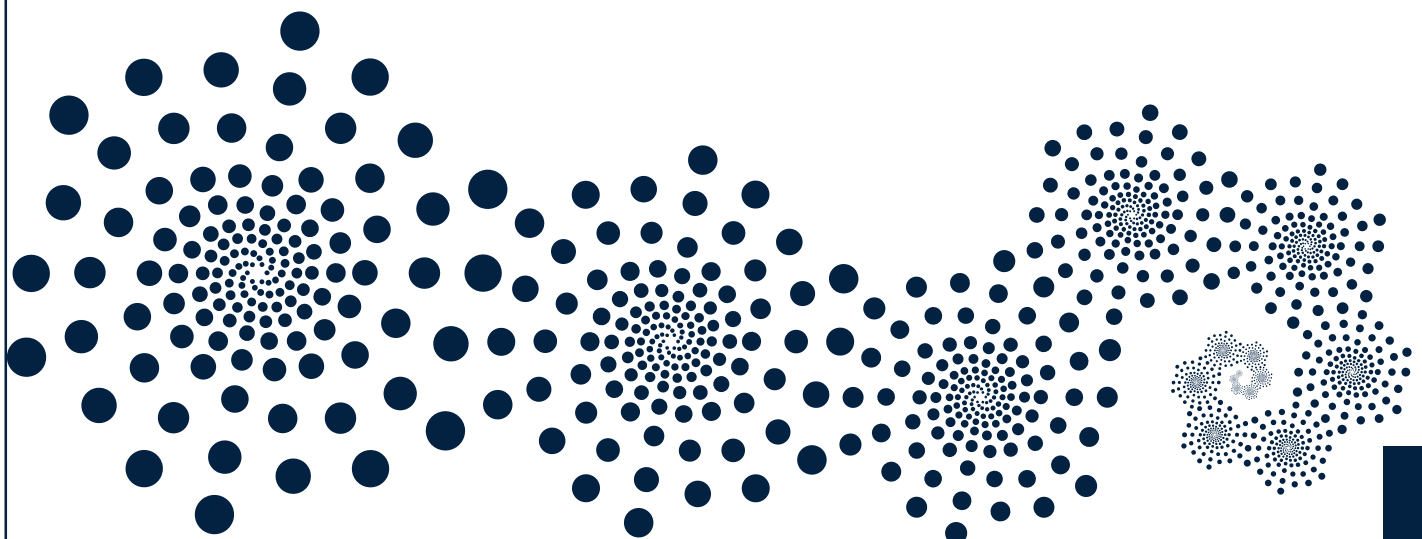


**Dr Prateek Jain**

Sr. Staff Research Scientist, Google AI  
Visiting Faculty Member, CSE, IIT Kanpur

Prateek Jain is a Senior Staff Research Scientist at Google AI, a visiting faculty member with our department (CSE, IITK), as well as an alumnus of IIT Kanpur (BT CSE 2004). He obtained his PhD degree from the Computer Science department at UT Austin and prior to joining Google Research, he was a Senior Principal Researcher at Microsoft Research India. Prateek works in the areas of large-scale and non-convex optimization, high-dimensional statistics, and ML for resource-constrained devices. His works have won multiple awards including best student paper awards at ICML 2007 and CVPR 2008 and the 2020 best paper award by the IEEE Signal Processing Society. Prateek has also received the Young Alumnus Award from IIT Kanpur and the ACM India Early Career Researcher Award. He is an action editor for JMLR, an associate editor for the SIMODS journal and regularly serves on the senior program committees of top ML conferences.

# Head's Report 2020-2022



# Head's Report

To the graduating batch of students and their family and friends, members of the CSE department faculty and staff, our guest of honor Dr. Prateek Jain, I extend a warm welcome to the 55th Convocation of the Indian Institute of Technology Kanpur. It gives me great pleasure to offer my congratulations to the graduating students on the behalf of the entire department. In particular, the department applauds all the award winners for aiming high and excelling in their chosen discipline.

## Graduation

A total of 119 students will be graduating today from the CSE department. Among them are 3 PhD, 2 MTech-PhD (joint degree), 4 MS by Research, 22 MTech, 5 BTech-MTech (dual degree) and 83 BTech students. Additionally, 8 students will be graduating with a second major from the CSE department. I would like to highlight the joint MTech-PhD degree program, which is a new initiative to encourage brilliant students to join the PhD program

right after their bachelor's degree. Similarly, one of our dual degree students will avail of flexible degree options and graduate with a BTech degree in CSE and an MTech degree in ECO.

Degree	Recipients
PhD	3
MTech-PhD	2
MSR	4
MTech	22
BTech-MTech	5
BTech	83
Double Major	8
<b>Total</b>	<b>119 + 8</b>

## Placement

The department continues to enjoy the best placement outcomes, with a placement rate of 96.3% in 2020 that rose to 97.6% in 2021. The outcomes are similarly excellent across programs with 96.2% and 97.9% students in UG and PG programs respectively getting placed through SPO drives.

## R&D Activities

Our department members are carrying out more than 40 consultancy and sponsored research projects with a total funding of more than 90 crores obtained from corporate bodies, government agencies and philanthropic organizations. This funding allows us to tackle the hardest of technical challenges in areas such as AI, blockchain, UAVs and high-performance

computing, forge new pathways in burning areas like clean air, climate change, cancer research, sustainable agriculture, and education for 1.5 billion Indians, as well as provide consultations to organizations of national importance such as the RBI and the NHA.

### **Teaching**

The institute recently launched an e-Masters program in Cybersecurity led by CSE members. Twelve new courses were also introduced since 2020 in areas such as AI, cyber-security, internet-of-things, smart devices and theoretical computer science. The department continues to maintain its vast repertoire of courses with over 90 course offerings being made in the last 4 semesters. There continues to be \ emphasis on PG courses in areas such as AI, machine learning and data science (19 offerings), cyber security and the internet of things (9 offerings), systems research (11 offerings) and theoretical computer science (14 offerings). These offerings cater to an ever-growing demand for CS instruction. Our average class strength exceeds 110, 53% offerings have more than 100 students, 28% have more than 150 and 15% have more than 200 students.

### **Outreach**

To provide support in times of distress, the department student affairs committee and the department counsellor have taken several initiatives such as creating student mentors who offer support to students facing difficulty with academics. To increase awareness about mental health, this outreach was recently expanded to include all students. Every incoming student is now offered a one-on-one counselling session where these initiatives are discussed and the student's emotional intelligence (EI) is assessed. Care is taken to follow up with not only students who are struggling with academics, but also those who demonstrate a lower EI score. These follow-ups help them relieve stress, learn to communicate more effectively, empathize with others, overcome challenges and defuse conflicts.

### **Outcomes and Achievements**

Our department members published more than 40 journal and 200 conference papers in the last 2 years. These papers targeted top venues in theory (J. ACM, FOCS, CCC, SODA), systems (ASPLOS, CAV, HPCA, ISCA) and AI and data sciences (ICML, NeurIPS, ICLR, CVPR, IJCAI, AAAI, CogSci, ICRA).

Our students and faculty members continue to bring laurels in the form of fellowships of national academies such as NASI and IASc, best paper awards and best teacher awards, corporate fellowships, scholarships and research grants. A list of prominent achievements by department members is available later in this brochure for your perusal.

### **New Faculty Members and Postdoctoral Fellows**

The department was fortunate to have Dr. T. V. Prabhakar continue as an emeritus fellow in 2020. Dr. Prabhakar led the HelloIITK team that enabled online courses to be offered during the lockdowns. The department has also welcomed six new faculty members since 2020 with diverse expertise such as hardware security, internet of things, sensor networks and machine learning. The department currently hosts five visiting faculty members and is pleased that our guest of honor today is among them. The department also hosted 8 new postdoctoral fellows in the last two years who have contributed to research and development activities in key areas such as cyber-security, AI, formal methods, NLP, affective computing, cyber-physical systems, IoT, complexity theory and information theory.

### **The New Normal and the Way Ahead**

The past couple of years have been marked with uncertainty and loss but also courage, resilience and camaraderie. Despite disruptions due to lockdowns and illness, academics and research continued unabated. Major credit for this goes to the CSE lab engineers and office staff who ensured that department services remained available 24x7, and our student tutors and teaching assistants, who enabled our vast array of course offerings to not only continue but expand as well.

As you go ahead to tread your chosen paths, you should strive for the loftiest of goals and maintain the highest standards of professional conduct in all your endeavors. Your training and expertise is an asset to the society although it may not appear so right away. Make sure that your efforts are directed at both personal and societal advancement. I conclude by congratulating the graduating students, all award winners and wishing them all the best with their future goals.

-- Mainak Chaudhuri

## New Courses Introduced

Course	Proposer	Year
Special Topics in Natural Language Processing	Dr. Ashutosh Modi	2020
Statistical Natural Language Processing	Dr. Ashutosh Modi	2020
Complexity measures for Boolean functions	Dr. Rajat Mittal	2021
Introduction to Internet of Things and its Industrial Applications	Dr. Priyanka Bagade	2021
Hardware Security for Internet-of-Things	Dr. Urbi Chatterjee	2021
Deep Reinforcement Learning	Dr. Ashutosh Modi	2021
Computational Linguistics for Indian Languages	Dr. Arnab Bhattacharya	2022
Sensing, Communications and Networking for Smart Wireless Devices	Dr. Amitangshu Pal	2022
Practical Cyber Security for Cyber Practitioners	Dr. Sandeep Shukla	2022
Gems from the world of data structures	Dr. Surender Baswana	2022
Design for Security	Dr. Debapriya Basu Roy	2022
Post Quantum Security	Dr. Debapriya Basu Roy	2022



# Notable Achievements and News

## Fellowships and Editorships

- Dr. Nitin Saxena was elected a Fellow of the Indian Academy of Sciences (IASc).
- Dr. Nitin Saxena was elected a fellow of the National Academy of Sciences, India (NASI)
- Dr. Ponnurangam Kumaraguru (visiting faculty member) was recognized as an ACM Distinguished Member for his contributions to computing.
- Dr. Nitin Saxena was invited to the founding editorial board of TheoretiCS, a new journal in Theoretical Computer Science.
- Dr. Nitin Saxena was profiled in DST's top 75 scientists (under age 50) who are "shaping today's India".

## Student Scholarships

- PhD student Nikhil Kumar Singh received the Prime Minister's Research Fellowship (PMRF) for his doctoral studies at IIT Kanpur.
- BTech students Shreya Kacholia and Nidhi Hegde received the Google Women Techmakers Scholarship 2020 in the Asia Pacific (APAC) region.

## Research Grants

- PhD student Dhanajit Brahma and his advisor Professor Piyush Rai were selected for the prestigious Qualcomm Innovation Fellowship 2020.
- Dr. Nisheeth Srivastava was selected to receive the Class of 1973 Young Faculty Fellowship.
- Dr. Ashutosh Modi and Dr. Swarnendu Biswas received the Google India Research Award 2021.
- Dr. Swarnendu Biswas received the Google exploreCS Research award to work with students from historically under-represented groups and expose them to CS research.

## Teaching Awards

- Dr. T. V. Prabhakar received the 1989 Batch Faculty Award in recognition of his contributions to improving undergraduate teaching through the use of technology innovation in the space of education.



## Teaching Awards (continued)

- Dr. Mainak Chaudhuri was elected by the CSE graduating batch of 2021 to receive the distinguished teacher award
- Dr. Piyush Rai received the Excellence in Teaching Award for 2021.
- Dr. Piyush Rai was elected by the CSE graduating batch of 2022 to receive the distinguished teacher award.

## Research Awards

- PhD students Sujit Kumar Muduli and Gourav Takhar and Dr. Pramod Subramanyan won the IEEE/ACM William J McCalla best paper award at the IEEE/ACM International Conference on Computer Aided Design 2020
- Dr. Hamim Zafar received the Har Govind Khorana-Innovative Young Biotechnologist Award 2020 from the Department of Biotechnology.
- The paper "A Deep Predictive Model for Tropical Cyclogenesis" by Abir Mukherjee and Dr. Preeti Malakar won the outstanding poster paper award at the 2020 International Conference on High-Performance Computing & Simulation.
- PhD student Pranjal Dutta won the Best Paper and Best Student Paper awards at the 16th International Computer Science Symposium in Russia (CSR 2021).
- The paper "Hypernetworks for Continual Semi-Supervised Learning" by PhD students Dhanajit Brahma, Vinay Kumar Verma, and Dr. Piyush Rai won the best student paper award at the International Workshop on Continual Semi-Supervised Learning to be held with IJCAI 2021.
- The paper "Engineering an Efficient Boolean Functional Synthesis Engine" authored by Priyanka Golia, Dr. Subhajit Roy, and their collaborators were selected as one of the six IEEE/ACM William J. McCalla best paper nominees at ICCAD 2021.
- The paper titled "Fine-Grained Emotion Prediction by Modeling Emotion Definitions," authored by Gargi Singh (BT-MT student), Dhanajit Brahma (PhD student), Dr. Piyush Rai, and Dr. Ashutosh Modi won the best student paper award at the International Conference on Affective Computing & Intelligent Interaction 2021.
- Dr. Purushottam Kar and collaborators from Microsoft and IIT Delhi won the Bing Ads "Greatness Award" in the engineering excellence category.

## Research Awards (continued)

- Dr. Ashutosh Modi and his students Vishal Keswani and Sakshi Singh have won the first prize at FinSim Shared Task organized at Workshop on Financial Technology and Natural Language Processing (FinNLP).
- The paper "Algebraic algorithms for variants of subset sum" by PhD students Pranjal Dutta and Mahesh Rajasree won the best student paper presentation award at CALDAM 2022.
- The paper titled "AGGLIO: Global Optimization for Locally Convex Functions" by Debojyoti Dey, Bhaskar Mukhoty, and Dr. Purushottam Kar was one of the three best paper finalists at CODS-COMAD 2022.

## New Faculty Members

**Dr. Priyanka Bagade** (joined 2021)

Research Areas: *Internet of things, Sensors, Mobile Computing and Deep Learning*

**Dr. Urbi Chatterjee** (joined 2021)

Research Areas: *Hardware Security, Physically Unclonable Functions, Secure Authentication Protocols Design and Internet of Things Security*

**Dr. Amitangshu Pal** (joined 2021)

Research Areas: *Wireless and Sensor Networks, Sensing and Communication for Internet of Things (IoT) and Building IoT Solutions for Smart Cities*

**Dr. Debapriya Basu Roy** (joined 2021)

Research Areas: *Hardware Security, VLSI for Cryptography and Post Quantum Cryptography*

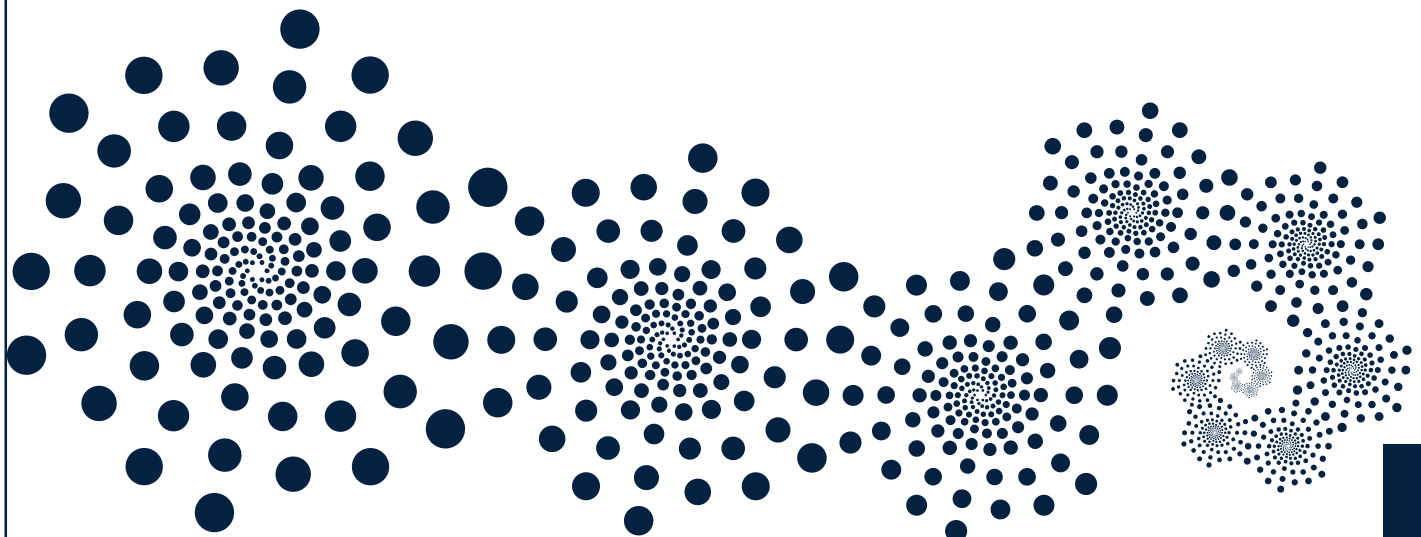
**Dr. Sutanu Gayen** (joined 2022)

Research Areas: *Foundations of Machine Learning and Probabilistic Algorithms*

**Dr. Jithin K Sreedharan** (joined 2022)

Research Areas: *Graph Mining, Machine Learning and AI for Social Good*

# Theory and Algorithms



## Consultancy and Sponsored Research Projects

1. *Algebraic Circuits: Learning the Inherent Structure* (SERB)  
Dr. Nitin Saxena
2. *Predictions for Covid-19 Trajectory* (CII Foundation)  
Dr. Manindra Agrawal
3. \* *Analysis Of Covid-19 Management Strategies by Group* (Govt. of Uttar Pradesh)  
Dr. Manindra Agrawal

**\* indicates a completed project**

# Publications

## Journal Publications

1. All Nearest Smaller Made Simple, Sanjeev Saxena, Parallel Processing Letters, 30(2), 2020.
2. Approximate Single-Source Fault Tolerant Shortest Path, S. Baswana, K. Choudhary, M. Hussain, L. Roditty, ACM Transactions on Algorithms, 16(4), 2020.
3. Modelling the spread of SARS-CoV-2 pandemic-Impact of lockdowns & interventions, Manindra Agrawal, Madhuri Kanitkar, M Vidyasagar, Indian Journal of Medical Research, 153(1):175-181, 2021.
4. Efficiently factoring polynomials modulo  $p^4$ , A. Dwivedi, R. Mittal, N. Saxena, Journal of Symbolic Computation, 104:805-823, 2021.
5. An analogue of Pillai's theorem for continued fraction normality and application to subsequences, S. Nandakumar, S. Pulari, P. Vishnoi, G. Viswanathan, Bulletin of the London Mathematical Society, 53(5):1414-1428, 2021.
6. Zone theorem for arrangements in dimension three, Sanjeev Saxena, Information Processing Lett., 172:106161, 2021.
7. Blackbox identity testing for sum of special ROABPs and its border class, Pranav Bisht, Nitin Saxena, Journal of Computational Complexity, 30(8), 2021.
8. Fault Tolerant Depth First Search in Undirected Graphs: Simple Yet Efficient, S. Baswana, S. Gupta, A. Tulsyan, Algorithmica, 2022.
9. On continued fractions and normality, S. Nandakumar, P. Vishnoi, Information and Computation, 285(B):104876, 2022.
10. Explicit construction of  $q + 1$  regular local Ramanujan graphs, for all prime-powers  $q$ , Rishabh Batra, Nitin Saxena, Devansh Shringi, computational complexity, 2022.
11. Discovering the Roots: Uniform Closure Results for Algebraic Classes Under Factoring, Pranjal Dutta, Nitin Saxena, Amit Sinhababu, Journal of the ACM, 69(3):18, 2022.

## Conference Publications

1. Randomized and symmetric catalytic computation, Samir Datta, Chetan Gupta, Rahul Jain, Vimal Raj Sharma, Raghunath Tewari, International Computer Science Symposium in Russia (CSR), 2020.

## Conference Publications (continued)

2. Special-case algorithms for blackbox radical membership, nullstellensatz and transcendence degree, Abhibhav Garg, Nitin Saxena, ISSAC, 2020.
3. Efficient isolation of perfect matching in  $O(\log n)$  genus bipartite graphs, Chetan Gupta, Vimal Raj Sharma, Raghunath Tewari, International Symposium on Mathematical Foundations of Computer Science (MFCS), 2020.
4. Mincut sensitivity data structures for the insertion of an edge, Surender Baswana, Shiv Gupta, Till Knollmann, ESA, 2020.
5. Hardness of Approximation of (Multi-)LCS over Small Alphabet, Amey Bhangale, Diptarka Chakraborty, Rajendra Kumar, International Conference on Approximation Algorithms for Combinatorial Optimization Problems (APPROX), 2020.
6. Computing Igusa's local zeta function of univariates in deterministic polynomial-time, Ashish Dwivedi, Nitin Saxena, Biannual Algorithmic Number Theory Symposium (ANTS), 2020.
7. Randomness and effective dimension of continued fractions, Satyadev Nandakumar, Prateek Vishnoi, International Symposium on Mathematical Foundations of Computer Science (MFCS), 2020.
8. On Algorithms to Find  $p$ -ordering, A. Gulati, S. Chakrabarti, R. Mittal, Conference on Algorithms and Discrete Applied Mathematics (CALDAM), 2021.
9. Reachability and Matching in Single Crossing Minor Free Graphs, S. Datta, C. Gupta, R. Jain, A. Mukherjee, V. R. Sharma, R. Tewari, Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 2021.
10. Well-founded extensive games with perfect information, Krzysztof R. Apt, Sunil Simon, Theoretical Aspects of Rationality and Knowledge (TARK), 2021.
11. Deterministic identity testing paradigms for bounded top-fanin depth-4 circuits, P. Dutta, P. Dwivedi, N. Saxena, Computational Complexity Conference (CCC), 2021.
12. Time Space Optimal Algorithm for Computing Separators in Bounded Genus Graphs, C. Gupta, R. Jain, R. Tewari, Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 2021.

## Conference Publications (continued)

13. SUTRA: An Approach to Modelling Pandemics with Undetected (Asymptomatic) Patients, and Applications to COVID-19, M. Agrawal, M. Kanitkar, M. Vidyasagar, IEEE Conference on Decision and Control (CDC), 2021.
14. Tight Chang's-lemma-type bounds for Boolean functions, S. Chakraborty, N. Mande, R. Mittal, T. Molli, M. Paraashar, S. Sanyal, Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS), 2021.
15. A Largish Sum-Of-Squares Implies Circuit Hardness and Derandomization, Pranjal Dutta, Nitin Saxena, Thomas Thierauf, Innovations in Theoretical Computer Science Conference (ITCS), 2021.
16. Improved (Provable) Algorithms for the Shortest Vector Problem via Bounded Distance Decoding, Divesh Aggarwal, Yanlin Chen, Rajendra Kumar, Yixin Shen, International Symposium on Theoretical Aspects of Computer Science (STACS), 2021.
17. Ergodic theorems and converses for PSPACE functions, Satyadev Nandakumar, Subin Pulari, International Symposium on Mathematical Foundations of Computer Science (MFCS), 2021.
18. Dimension-Preserving Reductions Between SVP and CVP in Different  $p$ -Norms, Divesh Aggarwal, Yanlin Chen, Rajendra Kumar, Zeyong Li, Noah Stephens-Davidowitz, ACM-SIAM Symposium on Discrete Algorithms (SODA), 2021.
19. Demystifying the border of depth-3 algebraic circuits, P. Dutta, P. Dwivedi, N. Saxena, Annual IEEE Symposium on Foundations of Computer Science (FOCS), 2021.
20. Algebraic algorithms for variants of subset sum, Mahesh Sreekumar Rajasree, Pranjal Dutta, Conference on Algorithms and Discrete Applied Mathematics (CALDAM), 2022.
21. Dynamic Meta-theorems for Distance and Matching, Samir Datta, Chetan Gupta, Rahul Jain, Anish Mukherjee, Vimal Raj Sharma, Raghunath Tewari, EATCS International Colloquium on Automata, Languages, and Programming (ICALP), 2022.
22. Minimum+1  $(s,t)$ -cuts and dual edge sensitivity oracle, Surender Baswana, Koustav Bhanja, Abhyuday Pandey, EATCS International Colloquium on Automata, Languages, and Programming (ICALP), 2022.



## Conference Publications (continued)

23. Sensitivity Oracles for All-Pairs Mincuts, Surender Baswana, Abhyuday Pandey, ACM-SIAM Symposium on Discrete Algorithms (SODA), 2022.
24. Improved lower bound, and proof barrier, for constant depth algebraic circuits, C.S. Bhargav, Sagnik Dutta, Nitin Saxena, International Symposium on Mathematical Foundations of Computer Science (MFCS), 2022.

## Invited Talks and Seminars

Title: *Determinant and permanent of a matrix using 2-connected components in the digraph*

Speaker: Dr Ranveer Singh, Assistant Professor, IIT Indore

Date: June 1st, 2021

Title: *Aspects of Index Calculus Algorithms for Discrete Logarithm and Class Group Computations*

Speaker: Dr. Madhurima Mukhopadhyay, ISI Kolkata

Date: December 1st, 2021

Title: *Lattices in Cryptography, Past, Present, and Future*

Speaker: Dr. Angshuman Karmakar, Katholieke Universiteit Leuven, Belgium

Date: January 4th, 2022

Title: *Algorithmic foundation of parallel paging*

Speaker: Dr. Rathish Das, University of Waterloo

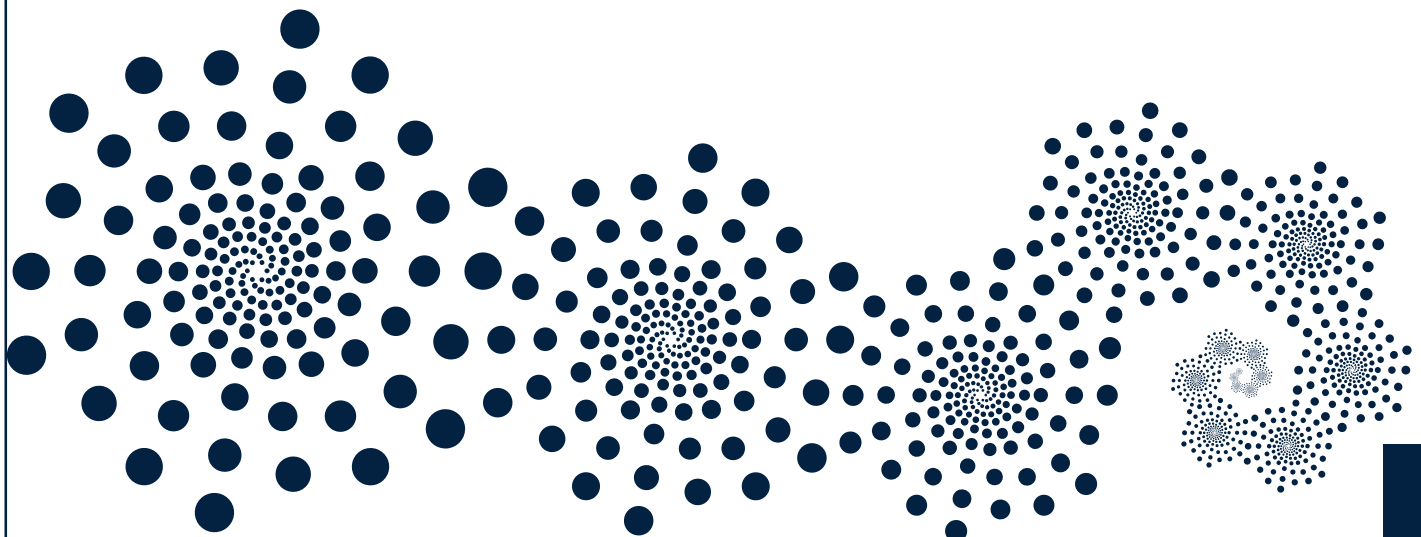
Date: January 6th, 2022

Title: *Spectral Methods in Modern Graph Algorithms*

Speaker: Akash Kumar, Postdoctoral Fellow, EPFL

Date: February 8th, 2022

# Systems and Architecture



## Consultancy and Sponsored Research Projects

1. *National Interdisciplinary Center for Cyber Security and Cyber Defense of Critical Infrastructures* (SERB)  
Dr. Manindra Agrawal and Dr. Sandeep Kumar Shukla
2. *UK-India Clean Energy Research Institute* (DST)  
Dr. Sandeep Kumar Shukla
3. *Development of National Blockchain and Demonstration of Two Strategic Applications* (National Security Council Secretariat)  
Dr. Manindra Agrawal and Dr. Sandeep Kumar Shukla
4. *RAA Labs for Samagra Shiksha Delhi* (UEE MISSION, Delhi Govt.)  
Dr. Amey Karkare
5. *Effective Sparse Matrix Vector Multiplication with Unsupervised Learning* (Intel)  
Dr. Swarnendu Biswas
6. *Optimal Online Data Analysis And Visualization of Weather Simulations at Exascale* (SERB)  
Dr. Preeti Malakar
7. *UAV and Soil Health Monitoring for Agriculture Applications* (Govt. of Uttar Pradesh)  
Dr. Manindra Agrawal, Dr. A. K. Ghosh and Dr. Jayant K. Singh
8. *\* Technology Innovation Hub in Cyber Security and Cyber Security of Cyber Physical Systems* (SERB)  
Dr. Manindra Agrawal and Dr. Sandeep Kumar Shukla
9. *\* Efficient Memory Sub-System for Mobile Computing Platform* (Qualcomm)  
Dr. Biswabandan Panda
10. *\* Establishment of Tinkering Labs in Government Secondary Schools of Uttarakhand* (Samagra Shiksha, Govt. of Uttarakhand)  
Dr. Amey Karkare
11. *Operation and Maintenance of Advanced Cyber Security System and Research Center at NHAI* (NHAI)  
Dr. Manindra Agrawal and Dr. Sandeep Kumar Shukla
12. *Providing Guidance on Technical Aspects to the RBI* (RBI)  
Dr. Sandeep Kumar Shukla
13. *\* Integrated Online Air Pollution Monitoring And Decision Support System* (Clean Air Fund)  
Dr. Amey Karkare and Dr. Sachichidanand Tripathi

## Consultancy and Sponsored Research Projects (continued)

14. *HCL Hack IITK 2021* (IIT Alumni Association – Delhi Chapter)  
Dr. Manindra Agrawal and Dr. Sandeep Kumar Shukla
15. \* *MobiMOOC Portal: Applied Research and Management Support*  
(Commonwealth of Learning)  
Dr. T. V. Prabhakar
16. \* *Independent Review of RFP of Online Revenue Management System*  
(Uttar Pradesh Power Corporation)  
Dr. Amey Karkare and Dr. Ankush Sharma
17. \* *THDCIL Network Security Assessment* (THDC)  
Dr. Sandeep Kumar Shukla
18. \* *Consultancy to Smart City Mission* (Smart City Mission)  
Dr. Manindra Agrawal
19. \* *Preparing Analytical Report on Top 50 Cyber Attacks* (MHA)  
Dr. Sandeep Kumar Shukla
20. \* *Analytical Report to Study the Challenges of Cyber Space and Policy*  
(MHA)  
Dr. Sandeep Kumar Shukla
21. \* *Bid Evaluation of Unified Revenue Management System* (Uttar Pradesh Power Corporation)  
Dr. Amey Karkare and Dr. Ankush Sharma

\* *indicates a completed project*

# Publications

## Book Chapters

1. Implementing Enterprise Cybersecurity With Open-Source Software and Standard Architecture, A. Handa, R. Negi, S. K. Shukla, In Implementing Enterprise Cybersecurity with Open-Source Software and Standard Architecture, River Publishers, 2021.
2. Feature Engineering and Analysis Toward Temporally Robust Detection of Android Malware, S. Jaiswal, A. Handa, N. Kumar, S. K. Shukla, In Implementing Enterprise Cybersecurity with Open-Source Software and Standard Architecture, River Publishers, 2021.
3. Resource-Aware Optimal Scheduling of In Situ Analysis, P. Malakar, V. Vishwanath, C. Knight, T. Munson, M. E. Papka, In In Situ Visualization for Computational Science, Springer, 2022.

## Editorials

1. Embedded computing and society, S. K. Shukla, ACM Transactions on Embedded Computing Systems, 18, 2020.
2. Rethinking and Re-evaluating in the Time of Crisis, S. K. Shukla, ACM Transactions on Embedded Computing Systems, 19, 2020.

## Journal Publications

1. Shared Pattern History Tables in Multicomponent Branch Predictors with a Dealiasing Cache, M. Das, A. Banerjee, M. Chaudhuri, B. Sardar, IEEE Embedded Systems Letters, 12(3):95-98, 2020.
2. Approaches for Assigning Offsets to Signals for Improving Frame Packing in CAN-FD, Prachi Joshi, S. S. Ravi, Qingyu Liu, Unmesh D. Bordoloi, Soheil Samii, Sandeep Shukla, Haibo Zeng, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 39(5):1109-1122, 2020.
3. A terminology for in situ visualization and analysis systems, Multiple authors, P. Malakar, Multiple authors, International Journal of High Performance Computing Applications, 34(6):676-691, 2020.
4. Construction of a Digital Twin Framework using Free and Open-Source Software Programs, K. Shah, T. V. Prabhakar, C. R. S., S. V. A., Kumar T. V., IEEE Internet Computing, 2021.

## Journal Publications (continued)

5. Detecting Malicious Accounts in Permissionless Blockchains using Temporal Graph Properties, R. Agarwal, S. Barve, S. K. Shukla, *Applied Network Science*, 6(9), 2021.
6. DAMARU: A Denial-of-Service Attack on Randomized Last-Level Caches, P. Kumar, C. S. Yashavant, B. Panda, *IEEE Computer Architecture Letters*, 20(2):138-141, 2021.
7. Insider attack mitigation in a smart metering infrastructure using reputation score and blockchain technology, J. Singh, A. Sinha, P. Goli, V. Subramanian, S. K. Shukla, O. P. Vyas, *International Journal of Information Security*, 21:527-546, 2021.
8. Instruction Criticality Based Energy-Efficient Hardware Data Prefetching, N. S. Kalani, B. Panda, *IEEE Computer Architecture Letters*, 20(2):146-149, 2021.
9. Distributed bounded model checking, P. Chatterjee, S. Roy, B. P. Diep, A. Lal, *Formal Methods in System Design*, 2022.
10. Debug-localize-repair: a symbiotic construction for heap manipulations, S. Verma, S. Roy, *Formal Methods in System Design*, 2022.
11. PAKAMAC: A PUF-based Keyless Automotive Entry System with Mutual Authentication, S. Gade, U. Chatterjee, D. Mukhopadhyay, *Springer Journal of Hardware and Systems Security*, 6, 2022.
12. MagLoc: A magnetic induction based localization scheme for fresh food logistics, Amitangshu Pal, Krishna Kant, *Internet of Things*, 19:100552, 2022.
13. Social Media Driven Big Data Analysis for Disaster Situation Awareness: A Tutorial, Amitangshu Pal, Junbo Wang, Yilang Wu, Krishna Kant, Zhi Liu, Kento Sato, *IEEE Transactions on Big Data*, 2022.
14. Performance Evaluation of Magnetic Resonance Coupling Method for Intra-Body Network (IBNet), Sayemul Islam, Rajpreet Kaur Gulati, Michael Domic, Amitangshu Pal, Krishna Kant, Albert Kim, *IEEE Transactions on Biomedical Engineering*, 69(6):1901-1908, 2022.

## Conference Publications

1. Achieving Privacy-Utility Trade-off in existing Software Systems, Saurabh Srivastava, Vinay P. Namboodiri and T. V. Prabhakar, *Journal of Physics: Conference Series*, 2020.



## Conference Publications (continued)

2. A Report on Tutorials co-located with ISEC 2020, Amey Karkare, ACM Innovations in Software Engineering Conference (ISEC), 2020.
3. Peacenik: Architecture support for not failing under fail-stop memory consistency, Rui Zhang, Swarnendu Biswas, Vignesh Balaji, Michael D. Bond, Brandon Lucia, ACM ASPLOS, 2020.
4. Evading API Call Sequence Based Malware Classifiers, Fenil Fadadu, Anand Handa, Nitesh Kumar, Sandeep Kumar Shukla, International Conference on Information and Communications Security, 2020.
5. Multi-tenant Quality Attributes to Manage Tenants in SaaS Applications, S. Kalra, T. V. Prabhakar, IEEE International Conference on Software Architecture Companion (ICSA-C), 2020.
6. Intent Sets: Architectural Choices for Building Practical Chatbots, Saurabh Srivastava, T. V. Prabhakar, ACM International Conference on Computer and Automation Engineering, 2020.
7. Selection of Code Segments for Exclusion from Code Similarity Detection, Simon, Oscar Karnalim, Judy Sheard, Ilir Dema, Amey Karkare, Juho Leinonen, Michael Liut, Renee McCauley, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2020.
8. Detecting Malicious Accounts on the Ethereum Blockchain with Supervised Learning, Nitesh Kumar, Ajay Singh, Anand Handa, Sandeep Kumar Shukla, International Symposium on Cyber Security Cryptography and Machine Learning (CSCML), 2020.
9. Adaptive and efficient transfer for online remote visualization of critical weather applications, P. Malakar, V. Natarajan, S. S. Vadhiyar, International Conference on Computational Science (ICCS), 2020.
10. Manthan: A Data-Driven Approach for Boolean Function Synthesis, Priyanka Golia, Subhajit Roy, Kuldeep S. Meel, International Conference on Computer-Aided Verification (CAV), 2020.
11. Thermal load-aware adaptive scheduling for heterogeneous platforms, Srijeeta Maity, Anirban Ghose, Soumyajit Dey, Swarnendu Biswas, International Conference on VLSI Design, 2020.
12. Interactive debugging of concurrent programs under relaxed memory models, A. Verma, P. K. Kalita, A. Pandey, S. Roy, ACM/IEEE International Symposium on Code Generation and Optimization (CGO), 2020.



## Conference Publications (continued)

13. Improving learning by imitation in online courses using memorization, learning by doing and lecture architecture for naive programmers, Siddharth Srivastava, Shalini Lamba, T.V. Prabhakar, IEEE International Conference on Advanced Learning Technologies (ICALT), 2020.
14. Lecture breakup-a strategy for designing pedagogically effective lectures for online education systems, Siddharth Srivastava, Shalini Lamba, T.V. Prabhakar, IEEE International Conference on Advanced Learning Technologies (ICALT), 2020.
15. Phase Transition Behavior in Knowledge Compilation, Rahul Gupta, Subhajit Roy, Kuldeep S. Meel, International Conference on Principles and Practice of Constraint Programming (CP), 2020. Bouquet of Instruction Pointers: Instruction Pointer Classifier-based Spatial Hardware Prefetching, Samuel Pakalapati, Biswabandan Panda, ACM/IEEE ISCA, 2020.
16. A methodology for principled approximation in visual SLAM, Yan Pei, Swarnendu Biswas, Donald S. Fussell, Keshav Pingali, Parallel Architectures and Compilation Techniques (PACT), 2020.
17. MAP: A Visual Analytics System for Job Monitoring and Analysis, Ashish Pal, Preeti Malakar, IEEE International Conference on Cluster Computing (CLUSTER), 2020.
18. Desirable Features of a Chatbot-building Platform, Saurabh Srivastava, T. V. Prabhakar, IEEE International Conference on Humanized Computing and Communication with Artificial Intelligence (HCCAI), 2020.
19. Diagnosing software faults using multiverse analysis, Prantik Chatterjee, Abhijit Chatterjee, Jose Campos, Rui Abreu, Subhajit Roy, International Joint Conference on Artificial Intelligence (IJCAI), 2020.
20. STDNeut: Neutralizing sensor, telephony system and device state information on emulated android environments, Saurabh Kumar, Debadatta Mishra, Biswabandan Panda, Sandeep K. Shukla, International Conference on Cryptology and Network Security, 2020.
21. Detecting word based DGA domains using ensemble models, P. V. Sai Charan, Sandeep K. Shukla, P. Mohan Anand, International Conference on Cryptology and Network Security, 2020.
22. An Insecurity Study of Ethereum Smart Contracts, Bishwas C. Gupta, Nitesh Kumar, Anand Handa, Sandeep K. Shukla, International Conference on Security, Privacy, and Applied Cryptography Engineering (SPACE), 2020.

## Conference Publications (continued)

23. Choosing Code Segments to Exclude from Code Similarity Detection, Simon, Oscar Karnalim, Judy Sheard, Ilir Dema, Amey Karkare, Juho Leinonen, Michael Liut, Renée McCauley, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2020.
24. Intrusion Detection & Prevention in Programmable Logic Controllers: A Model-driven Approach, Rohit Negi, Aneet Dutta, Anand Handa, Ujjwal Ayyangar, Sandeep K Shukla, IEEE Conference on Industrial Cyberphysical Systems (ICPS), 2020.
25. Decentralized Device Authentication Model using the Trust Score and Blockchain Technology for Dynamic Networks, Venkatesan Subramanian, Yuvaraj Rajendra, Shubham Sahai, Sandeep K. Shukla, IEEE International Conference on Blockchain (Blockchain), 2020.
26. Verity: Blockchain Based Framework to Detect Insider Attacks in DBMS, Shubham Sahai, Medha Atre, Shubham Sharma, Rahul Gupta, Sandeep K. Shukla, IEEE International Conference on Blockchain (Blockchain), 2020.
27. Contextual Reactive Pattern on Chatbot building Platforms, S. Srivastava, S. Kalra, T. V. Prabhakar, European Conference on Pattern Languages of Programs (EuroPLoP), 2020.
28. MICD - A Framework for Designing Micro-Conclusions for Micro-Lectures, Siddharth Srivastava, T. V. Prabhakar, R10 Humanitarian Technology Conference (R10-HTC), 2020.
29. Selection of Code Segments for Exclusion from Code Similarity Detection, Oscar Karnalim, Judy Sheard, Ilir Dema, Amey Karkare, Juho Leinonen, Michael Liut & Renée McCauley, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2020.
30. Choosing Code Segments to Exclude from Code Similarity Detection, Oscar Karnalim, Judy Sheard, Ilir Dema, Amey Karkare, Juho Leinonen, Michael Liut & Renée McCauley, Working Group Reports on ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE WGR), 2020.
31. Verification of Quantitative Hyperproperties Using Trace Enumeration Relations, Shubham Sahai, Rohit Sinha, Pramod Subramanyan, International Conference on Computer-Aided Verification (CAV), 2020.

## Conference Publications (continued)

32. HyperFuzzing for SoC Security Validation, Sujit Kumar Muduli, Gourav Takhar, Pramod Subramanyan, International Conference On Computer Aided Design (ICCAD), 2020.
33. Zero Directory Eviction Victim: Unbounded Coherence Directory and Core Cache Isolation, M. Chaudhuri, IEEE HPCA, 2021.
34. Malware Detection in Word Documents Using Machine Learning, Riya Khan, Nitesh Kumar, Anand Handa, Sandeep K. Shukla, International Conference on Advances in Cyber Security (ACeS), 2021.
35. Static Ransomware Analysis Using Machine Learning and Deep Learning Models, Kartikeya Gaur, Nitesh Kumar, Anand Handa, Sandeep K. Shukla, International Conference on Advances in Cyber Security (ACeS), 2021.
36. Instructor Performance on Progressively Complex Programming Tasks: A Multi-Institutional Study from India, Viraj Kumar, Amey Karkare, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2021.
37. Parallel Program Scaling Analysis using Hardware Counters, S. Jagga, P. Malakar, International Symposium on High-Performance Parallel and Distributed Computing (HPDC), 2021.
38. Seclusive Cache Hierarchy for Mitigating Cross-Core Cache and Coherence Directory Attacks, V. Gupta, V. Ganesan, B. Panda, Design, Automation and Test in Europe (DATE), 2021.
39. Robust Multivariate Anomaly-Based Intrusion Detection System for Cyber-Physical Systems, A. K. Dutta, R. Negi, S. K. Shukla, International Symposium on Cyber Security Cryptography and Machine Learning (CSCML), 2021.
40. Demand Manipulation Attack Resilient Privacy Aware Smart Grid Using PUFs and Blockchain, S. Ghosh, U. Chatterjee, D. Chatterjee, R. Masburah, D. Mukhopadhyay, S. Dey, International Conference on Applied Cryptography and Network Security (ACNS), 2021.
41. Zero inclusion victim: Isolating core caches from inclusive last-level cache evictions, M. Chaudhuri, ACM/IEEE ISCA, 2021.
42. AutoPrompt: A desktop application for designing micro-lectures using micro-prompt strategy for online education systems, S. Srivastava, T. V. Prabhakar, IEEE International Conference on Advanced Learning Technologies (ICALT), 2021.

## Conference Publications (continued)

43. Learning differentially private mechanisms, S. Roy, J. Hsu, A. Albarghouthi, IEEE Symposium on Security and Privacy (SOSP), 2021.
44. Specification Guided Automated Synthesis of Feedback Controllers, N. K. Singh, I. Saha, ACM Transactions on Embedded Computing Systems (TECS), 2021.
45. Thermal-aware Adaptive Platform Management for Heterogeneous Embedded Systems, S. Maity, A. Ghose, S. Dey, S. Biswas, ACM Transactions on Embedded Computing Systems (TECS), 2021.
46. Inferring DNN layer-types through a Hardware Performance Counters based Side Channel Attack, B. A. D. Kumar , S. C. R. Teja, S. Mittal, B. Panda, C. K. Mohan, International Conference on AI-ML-Systems, 2021.
47. Federated matched averaging with information-gain based parameter sampling, S. Shukla, N. Srivastava, International Conference on AI-ML-Systems, 2021.
48. SACReD: An Attack Framework on SAC Resistant Delay-PUFs leveraging Bias and Reliability Factors, D. Chatterjee, U. Chatterjee, D. Mukhopadhyay, A. Hazra, ACM/IEEE Design Automation Conference (DAC), 2021.
49. Supervised Machine Learning-Based DDoS Defense System for Software-Defined Network, G. Siddiqui, S. K. Shukla, Machine Vision and Augmented Intelligence—Theory and Applications, 2021.
50. Some Patterns for Architecting Lectures, S. Srivastava, T. V. Prabhakar, European Conference on Pattern Languages of Programs (EuroPLOP), 2021.
51. A Storage Efficient Blockchain Model for Constrained Applications, Y. Rajendra, S. Sahu, V. Subramanian, S. K. Shukla, International Conference on Blockchain Computing and Applications (BCCA), 2021.
52. Empirical Analysis of Architectural Primitives for NVRAM Consistency, K. P. Arun, D. Mishra, B. Panda, IEEE International Conference on High Performance Computing, Data, and Analytics (HiPC), 2021.
53. Towards Malicious address identification in Bitcoin, D. Chaudhari, R. Agarwal, S. K. Shukla, IEEE International Conference on Blockchain (Blockchain), 2021.
54. An Integrated Job Monitor, Analyzer and Predictor, A. Pal, P. Malakar, IEEE International Conference on Cluster Computing (ICCC), 2021.

## Conference Publications (continued)

55. Analysis and Modeling of the Impact of Covid-19 Response Measures on Power Demand, J. Chakraborty, S. V. Chakraborty, S. K. Shukla, Asia-Pacific Power and Energy Engineering Conference (APPEEC), 2021.
56. Revisiting UAV Authentication Schemes: Practical Attacks on Aviation Infrastructure, H. Mondal, U. Chatterjee, Asian Hardware Oriented Security and Trust Symposium (AsianHOST), 2021.
57. Auto-PUFChain: An Automated Interaction Tool for PUFs and Blockchain in Electronic Supply Chain, C. K. Chaudhary, U. Chatterjee, D. Mukhopadhyay, Asian Hardware Oriented Security and Trust Symposium (AsianHOST), 2021.
58. Android Malware Family Classification: What Works-API Calls, Permissions or API Packages?, S. Kumar, D. Mishra, S. K. Shukla, International Conference on Security of Information and Networks (SIN), 2021.
59. Symmetric Component Caching for Model Counting on Combinatorial Instances, van T. Bremen, V. Derkinderen, S. Sharma, S. Roy, K. S. Meel, AAAI, 2021.
60. Execution- and Prediction-Based Auto-Tuning of Parallel Read and Write Parameters, Megha Agarwal, Pragya Jain, Divyansh Singhvi, Preeti Malakar, IEEE 23rd Int Conf on High Performance Computing & Communications; 7th Int Conf on Data Science & Systems; 19th Int Conf on Smart City; 7th Int Conf on Dependability in Sensor, Cloud & Big Data Systems & Application (HPCC/DSS/SmartCity/DependSys), 2021.
61. Inclusive Accommodations for Persons with Visual Impairments in Computer Based Tests, Pawan Patel, Amey Karkare and Gaurav Raheja, International Conference on Universal Design (UD), 2021.
62. Instructor Performance on Progressively Complex Programming Tasks: A Multi-Institutional Study from India, Viraj Kumar, Amey Karkare, ACM Conference on Innovation and Technology in Computer Science Education (ITiCSE), 2021.
63. Adversaries Strike Hard: Adversarial Attacks against Malware Classifiers using Dynamics API calls as Features, Hariom, Anand Handa, Nitesh Kumar, Sandeep Kumar Shukla, International Symposium on Cyber Security Cryptography and Machine Learning (CSCML), 2021.



## Conference Publications (continued)

64. Engineering an Efficient Boolean Functional Synthesis Engine, Priyanka Golia, Friedrich Slivovsky, Subhajit Roy, Kuldeep S. Meel, International Conference On Computer Aided Design (ICCAD), 2021.
65. Analysis of NVMe-SSD to passthrough GPU data transfer in virtualized systems, Arunkumar Vediappan, Debadatta Mishra, ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE), 2021.
66. Program Synthesis as Dependency Quantified Formula Modulo Theory, Priyanka Golia, Subhajit Roy, Kuldeep S. Meel, International Joint Conference on Artificial Intelligence (IJCAI), 2021.
67. Designing Samplers is Easy: The Boon of Testers, Priyanka Golia, Mate Soos, Sourav Chakraborty, Kuldeep S. Meel, Formal Methods in Computer-Aided Design (FMCAD), 2021.
68. Provisioning Differentiated QoS for NVMe over Fabrics, Joyanta Biswas, Jit Gupta, Krishna Kant, Amitangshu Pal, Dave Minturn, IEEE Conference on Local Computer Networks (LCN), 2021.
69. DeepDetect: A Practical On-device Android Malware Detector, Saurabh Kumar, Debadatta Mishra, Biswabandan Panda, Sandeep Kumar Shukla, International Conference on Software Quality, Reliability and Security (QRS), 2021.
70. Vulnerability and Transaction Behavior Based Detection of Malicious Smart Contracts, R. Agarwal, T. Thapliyal, S. K. Shukla, International Symposium on Cyberspace Safety and Security (CSS), 2022.
71. Automated Flag Detection and Participant Performance Evaluation for Pwnable CTF, M. Singh, R. Negi, S. K. Shukla, Silicon Valley Cybersecurity Conference (SVCC), 2022.
72. Network Data Remanence Side Channel Attack on SPREAD, H-SPREAD and Reverse AODV, P. Naik, U. Chatterjee, International Conference on Security, Privacy, and Applied Cryptography Engineering (SPACE), 2022.
73. HOLL: Program Synthesis for Higher Order Logic Locking, G. Takhar, R. Karri, C. Pilato, S. Roy, International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2022.
74. Smart Communication System Using Sign Language Interpretation, D. Bisht, M. Kojage, M. Shukla, Y. P. Patil, P. Bagade, Conference of Open Innovations Association (FRUCT), 2022.

## Conference Publications (continued)

75. kTRACKER: Passively Tracking KRACK using ML Model, A. Agrawal, U. Chatterjee, R. R. Maiti, ACM Conference on Data and Application Security and Privacy (CODASPY), 2022.
76. DIP Learning on CAS-Lock: Using Distinguishing Input Patterns for Attacking Logic Locking, A. Saha, U. Chatterjee, D. Mukhopadhyay, R. S. Chakraborty, Design, Automation and Test in Europe (DATE), 2022.
77. LEGenT: Localizing Errors and Generating Testcases for CS1, Nimisha Agarwal, Amey Karkare, Learning at Scale (L@S), 2022.
78. Is the Whole lesser than its Parts? Breaking an Aggregation based Privacy aware Metering Algorithm, Soumyadyuti Ghosh, Urbi Chatterjee, Rumia Masburah, Soumyajit Dey and Debdeep Mukhopadhyay, Euromicro Conference on Digital Systems Design, 2022.
79. Portkey: Hypervisor-Assisted Container Migration in Nested Cloud Environments, Chandra Prakash, Debadatta Mishra, Purushottam Kulkarni, Umesh Bellur, ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE), 2022.
80. On Quantitative Testing of Uniform Samplers, Mate Soos, Priyanka Golia, Sourav Chakraborty, Kuldeep S. Meel, International Conference on Principles and Practice of Constraint Programming (CP), 2022.
81. Characterization of Magnetic Communication Through Human Body, Rajpreet Kaur Gulati, Sayemul Islam, Amitangshu Pal, Krishna Kant, Albert Kim, IEEE Annual Consumer Communications & Networking Conference (CCNC), 2022.
82. A Scalable Shannon Entropy Estimator, Priyanka Golia, Brendan Juba, Kuldeep S. Meel, International Conference on Computer-Aided Verification (CAV), 2022.
83. Using Intersection of Unions to Minimize Multi-directional Linearization Error in Reachability Analysis, A. Adimoolam, I. Saha, ACM International Conference on Hybrid Systems: Computation and Control (HSCC), 2022.
84. Security risks in MQTT-based Industrial IoT Applications, T. Kiran, P. Bagade, IEEE International Conference on Omni-layer Intelligent Systems (COINS), 2022.
85. Electric Vehicle Battery Management using Digital Twin, K. Mohan, P. Bagade, IEEE International Conference on Omni-layer Intelligent Systems (COINS), 2022.

## Conference Publications (continued)

86. Managing Access Control in Large-Scale Multi-party IoT Systems, Pavana Pradeep Kumar, Krishna Kant, Amitangshu Pal, IEEE/ACM International Symposium on Cluster, Cloud and Internet Computing (CCGrid), 2022.
87. Ultrasonic vs. Magnetic Resonance Communication for Mixed Wearable and Implanted Devices, Rajpreet K Gulati Walia, Krishna Kant, Amitangshu Pal, IEEE IEEE International Conference on Communications (ICC), 2022.

## Workshop Publications

1. Communication-aware Job Scheduling using SLURM, Priya Mishra, Tushar Agrawal, Preeti Malakar, ACM International Conference on Parallel Processing Workshops (ICPP-W), 2020.
2. Network and Load-Aware Resource Manager for MPI Programs, Ashish Kumar, Naman Jain, Preeti Malakar, ACM International Conference on Parallel Processing Workshops (ICPP-W), 2020.
3. Reverse Engineering the Stream Prefetcher for Profit, Aditya Rohan, Biswabandan Panda, Prakhar Agarwal, IEEE European Symposium on Security and Privacy Workshops, 2020.
4. Explaining the Performance of Supervised and Semi-Supervised Methods for Automated Sparse Matrix Format Selection, S. Dhandhaniala, A. Deodhar, K. Pogorelov, S. Biswas, J. Langguth, International Conference on Parallel Processing Workshops (ICPP-W), 2021.
5. CatchAll: A Robust Multivariate Intrusion Detection System for Cyber-Physical Systems using Low Rank Matrix, A. K. Dutta, B. Mukhoty, S. K. Shukla, Workshop on CPS and IoT Security and Privacy, 2021.
6. Efficient Data Race Detection of Async-Finish Programs Using Vector Clocks, S. Kumar, A. Agrawal, S. Biswas, International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM), 2022.



## Invited Talks and Seminars

Title: *MI6: Secure Enclaves in a Speculative Out-of-Order Processor*

Speaker: Dr. Arvind, CSAIL, MIT

Date: January 3rd, 2020

Title: *Building Trustworthy Computing Systems: From Hardware to Machine Learning and Back*

Speaker: Dr. Siddharth Garg, Assistant Professor, NYU

Date: January 13th, 2020

Title: *Sustainability and Resiliency Enhancement of Electric Power and Communications Systems*

Speaker: Lamine Mili, Virginia Tech

Date: January 14th, 2020

Title: *Robust Unscented Kalman Filter for Power System Dynamic State Estimation using PMUs*

Speaker: Lamine Mili, Virginia Tech

Date: January 15th, 2020

Title: *Redesigning how networks work to make the network*

Speaker: Dr. Praveen Tamma, Princeton University

Date: January 27th, 2020

Title: *Security Leaks and Defenses in Smart Wearables*

Speaker: Dr. Diksha Shukla, Assistant Professor, University of Wyoming

Date: January 21st, 2020

Title: *Optimization of wearable sensor design*

Speaker: Dr. Priyanka Bagade, Arizona State University

Date: January 29th, 2020

Title: *Security and Privacy of Connected Autonomous Vehicles*

Speaker: Dr. Vireshwar Kumar, Postdoctoral Research Associate, Purdue University

Date: February 3rd, 2020

## Invited Talks and Seminars (continued)

Title: *Proactive Security Techniques for Social Engineering Attacks and More*

Speaker: Dr. Rakesh Verma, University of Houston

Date: February 14th, 2020

Title: *Drones as On-Demand Infrastructure for Next-Generation Wireless Networks*

Speaker: Dr. Ayon Chakraborty, Researcher, NEC Labs

Date: February 24th, 2020

Title: *Formal Verification and Security Analysis of High-level Synthesis*

Speaker: Ramanuj Chouksey, IIT Guwahati

Date: July 7th, 2020

Title: *Halide (DSL for fast image processing) – Parts 1 and 2*

Speaker: Mr. Suyog Sarda, Mr. Ravishankar Kolachana and Mr. Sushim Shrivastava, Qualcomm Technologies Compiler Team

Dates: November 19-20, 2020

Title: *Utilization of Mobile Application Projects under Neural disease diagnosis*

Speaker: Dr Mamta Pandey, Postdoctoral candidate, Jaypee University of Engineering & Technology, Guna

Date: June 16th, 2021

Title: *Side-Channel Leakage Quantification and Efficient Post-Quantum Architectures on Emerging Platforms: Next Generation Challenges in Hardware Security*

Speaker: Dr Debapriya Basu Roy, Technical University of Munich

Date: June 21st, 2021

Title: *Network-on-Chip (NoC) Performance Analysis and Optimization for Deep Learning Applications*

Speaker: Mr Sumit K Mandal, University of Wisconsin-Madison

Date: September 28th, 2021

## Invited Talks and Seminars (continued)

Title: *Composite Fault Diagnosis Protocols for Wireless Sensor*

Speaker: Dr Rakesh Ranjan Swain, NIT Rourkela

Date: September 28th, 2021

Title: *IOTA, from blockchain to DAG DLTs: technology and use cases*

Speaker: Dr Michele Nati (Head) and Dr Nenad Gligoric (Technical Lead),  
Telco and Infrastructure Development, IOTA Foundation

Date: November 24th, 2021

Title: *Network Anonymity, Privacy, (Anti-)Censorship and the Whole Nine Yards*

Speaker: Dr Sambuddho Chakraborty, IIIT Delhi

Date: November 25th, 2021

Title: *Illicit Accounts in the Cryptocurrency-Based Blockchain: Towards their detection*

Speaker: Dr Rachit Agarwal, C3I Center, IIT Kanpur

Date: November 26th, 2021

Title: *Energy-efficient Communication Architecture for beyond von-Neumann DNN Accelerators*

Speaker: Mr. Sumit K Mandal, PhD candidate, University of Wisconsin, Madison

Date: November 30th, 2021

Title: *Efficient Control-Scheduling co-Design of Cyber-Physical Systems*

Speaker: Dr. Sumana Ghosh, Visiting Research Associate, IIT Kharagpur

Date: January 18th, 2022

Title: *A Reliability-aware, Delay Guaranteed, and Resource Efficient Placement of Service Function Chains in Softwarized 5G Networks*

Speaker: Dr. Prabhu T, Post-doctoral fellow, IIT Madras

Date: January 20th, 2022

## Invited Talks and Seminars (continued)

Title: *Smart Platform to offer Evidence-based Personalized Support for Healthy and Independent Living at Private Spaces*

Speaker: Dr. Nagarajan Ganapathy, TU Braunschweig and Hannover Medical School, Germany

Date: January 25th, 2022

Title: *Beyond all-or-nothing: Facilitating User-preferred Privacy Provisioning while Supporting Device Usability in Socially-shared Settings*

Speaker: Dr. Saumay Pushp, Microsoft Research India

Date: February 17th, 2022

Title: *Next Gen Automated Reasoning: Beyond SAT Revolution*

Speaker: Kuldeep Meel, NUS Presidential Young Professor, NUS

Date: February 22nd, 2022

Title: *Ayurveda: From a Scientific Idea to the Market through Innovation*

Speaker: Dr Aniruddha Joshi, PhD candidate, IIT Bombay

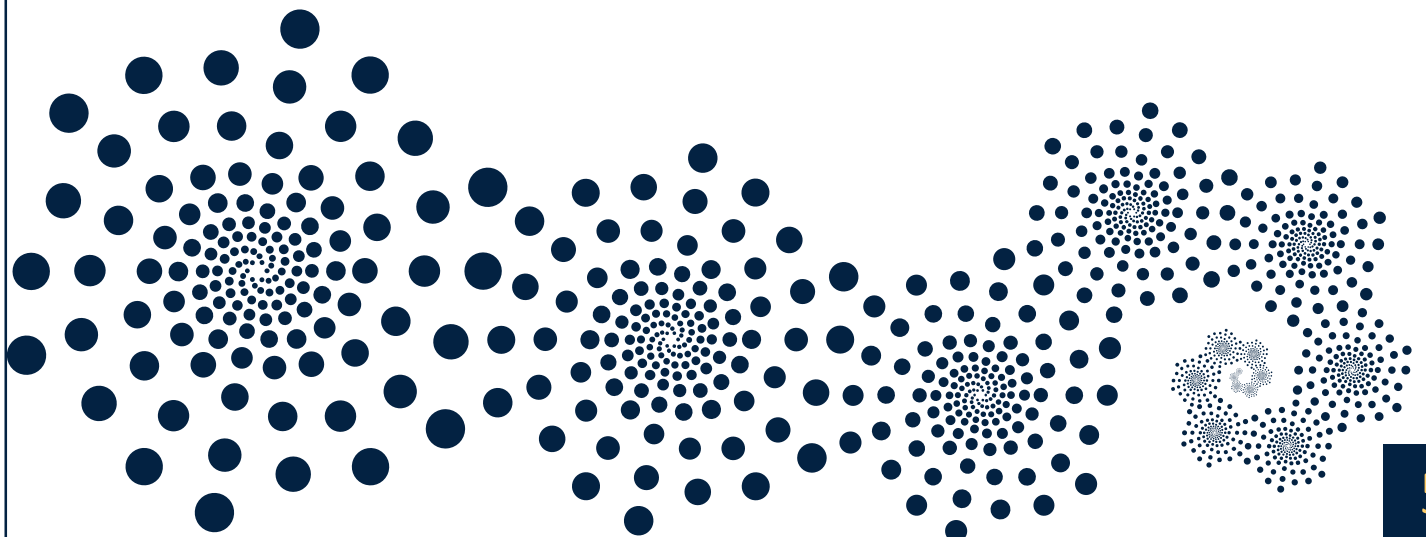
Date: March 10th, 2022

Title: *Securing Semiconductor IP Cores for DSP and multimedia applications*

Speaker: Dr. Mahendra Rathore, Postdoctoral candidate, cSE, IIT Kanpur

Date: March 22nd, 2022

# AI and Data Science



## Consultancy and Sponsored Research Projects

1. *IBM Research Faculty Award* (IBM)  
Dr. Piyush Rai
2. *Virtual Center for Extreme Classification* (Microsoft Research)  
Dr. Purushottam Kar and Dr. Piyush Rai
3. *Formal Verification of Autopilot Software for UAVs* (IFCPAR)  
Dr. Indranil Saha
4. *Automated Synthesis of Motion Plans for Large Scale Multi-Robot Systems from Complex Specifications* (DRDO)  
Dr. Indranil Saha
5. *Generation and Labelling of LIDAR Point Clouds for Automatic Classification Through CNN Approach* (DST)  
Dr. Bharat Lohani, Dr. Vinay P Namboodiri and Dr. Salil Goel
6. *Max-Planck Partner Group Project* (Max Plank Gesellschaft)  
Dr. Indranil Saha
7. *Nyaya: A Legal Assistance System for Legal Experts and the Common Man in India* (SERB)  
Dr. Arnab Bhattacharya
8. *Scalable Spatio-Temporal Measurement and Analysis of Air Pollution Data for Delhi-NCR using Vehicle-Mounted Sensors* (SERB)  
Dr. Arnab Bhattacharya
9. *Design of Feedback Controllers for Safe Operations of Autonomous Systems* (SERB)  
Dr. Indranil Saha
10. *Short and Long-Term Fog Predictions Using Data Science* (MHRD)  
Dr. Arnab Bhattacharya, Dr. Mahendra Verma and Dr. Shivam Tripathi
11. *Characterizing the Evolution of Naming Conventions in India* (SERB)  
Dr. Nisheeth Srivastava
12. *Reconstructing Cell Lineage, Invariant and Variable Lineage Maps by Integrating Mutation and Transcriptomic Data from Dynamic Lineage Tracing Experiments* (SERB)  
Dr. Hamim Zafar
13. *Creation of Science and Technology Content for Indic Wikipedia by IIT Kanpur* (DST)  
Dr. Arnab Bhattacharya and Dr. T. V. Prabhakar
14. *Bridging the Genomic and Transcriptional Heterogeneity in Oral Cancer for Identifying Clinically Relevant Features* (DBT)  
Dr. Hamim Zafar

## Consultancy and Sponsored Research Projects (continued)

15. *Affective Machines: A Multimodal Approach for Creating Humane Machines* (SERB)  
Dr. Ashutosh Modi
16. *NLP Technologies for Judgement Database* (Digi e-Books)  
Dr. Ashutosh Modi
17. *Text-To-Text Translation Among Indian Languages Using Sanskrit-based Interlingua Representation* (MEITY)  
Dr. Arnab Bhattacharya
18. *Automated Question-Answering Systems for Ramayana* (AICTE)  
Dr. Arnab Bhattacharya
19. *Anomaly Detection in Exam Logs* (Ernst & Young)  
Dr. Nisheeth Srivastava
20. *Extreme Classification* (Microsoft Research)  
Dr. Purushottam Kar
21. *Elucidata* (Elucidata Data Consulting)  
Dr. Ashutosh Modi
22. *\* Improving Software for Grain Analysis* (Indosaw)  
Dr. Nisheeth Srivastava

**\* indicates a completed project**

# Publications

## Editorial

1. Program Chairs' Preface, A. Bhattacharya, J. L. M. Li, D. Agrawal, P. M. Deshpande, D. Jiang, R. Krishnamurthy, R. Gupta, K. Takeda, L. Bellatreche, V. Pudi, S. Srinivasa, P. Fournier-Viger, Proceedings of the 27th International Conference on Database Systems for Advanced Applications (DASFAA), 2022.

## Journal Publications

1. FALF ConvNets: Fatuous auxiliary loss based filter-pruning for efficient deep CNNs, Pravendra Singh, Vinay Sameer Raja Kadi, Vinay P. Namboodiri,, Image and Vision Computing, 93:103857, 2020.
2. HetConv: Beyond Homogeneous Convolution Kernels for Deep CNNs, Pravendra Singh, Vinay Kumar Verma, Piyush Rai, Vinay P. Namboodiri,, International Journal of Computer Vision, 128:2068-2088, 2020.
3. EDS pooling layer, Pravendra Singh, Prem Raj, Vinay P. Namboodiri, Image and Vision Computing, 98:103923, 2020.
4. Single-cell lineage tracing by integrating CRISPR-Cas9 mutations with transcriptomic data, Hamim Zafar, Chieh Lin, Ziv Bar-Joseph, Nature Communications, 11(1), 2020.
5. GIFSL - Grafting based Improved Few-Shot Learning, Pratik Mazumder, Pravendra Singh, Vinay P. Namboodiri, Image and Vision Computing, 104, 2020.
6. Acceleration of Deep Convolutional Neural Networks Using Adaptive Filter Pruning, Pravendra Singh, Vinay Kumar Verma, Piyush Rai, Vinay P. Namboodiri, IEEE Journal on Selected Topics in Signal Processing, 14(4):838-847, 2020.
7. ChiSeL: Graph similarity search using chi-squared statistics in large probabilistic graphs, Shubhangi Agarwal, Sourav Dutta, Arnab Bhattacharya, Proceedings of the VLDB Endowment, 13(10):1654-1668, 2020.
8. Specification-Guided Automated Debugging of CPS Models, Nikhil Kumar Singh, Indranil Saha, IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 39(11):4142-4153, 2020.



## Journal Publications (continued)

9. Epidemiologically and Socio-economically Optimal Policies via Bayesian Optimization, Amit Chandak, Debojyoti Dey, Bhaskar Pratim Mukhoty, Purushottam Kar, Transactions of the Indian National Academy of Engineering, 5:117-127, 2020.
10. A parameterized perspective on protecting elections, P. Dey, N. Misra, S. Nath, G. Shakya, Theoretical Computer Science, 874:15-31, 2021.
11. Quality of concept maps is affected by map building strategies, Anveshna Srivastava, Nisheeth Srivastava, Sanjay Chandrasekharan, Biochemistry and Molecular Biology Education, 49(1):129-139, 2021.
12. Probabilistic framework for solving visual dialog, Badri N. Patro, Anupriy, Vinay P. Namboodiri, Pattern Recognition, 110, 2021.
13. Revisiting paraphrase question generator using pairwise discriminator, Badri N. Patro, Dev Chauhan, Vinod K. Kurmi, Vinay P. Namboodiri, Neurocomputing, 420:149-161, 2021.
14. Robust statistical calibration and characterization of portable low-cost air quality monitoring sensors to quantify real-time O<sub>3</sub> and NO<sub>2</sub> concentrations in diverse environments, R. Sahu, A. Nagal, K. K. Dixit, H. Unnibhavi, S. Mantravadi, S. Nair, Y. Simmhan, B. Mishra, R. Zele, R. Sutaria, V. M. Motghare, P. Kar, S. N. Tripathi, Atmospheric Measurement Techniques, 14(1):37-52, 2021.
15. Uncertainty Class Activation Map (U-CAM) Using Gradient Certainty Method, Badri Narayana Patro, Mayank Lunayach, Vinay P. Namboodiri, IEEE Transactions on Image Processing, 30:1910-1924, 2021.
16. Artificial Intelligence–assisted chest X-ray assessment scheme for COVID-19, K. Rangarajan, S. Muku, A. K. Garg, P. Gabra, S. H. Shankar, N. Nischal, K. D. Soni, A. S. Bhalla, A. Mohan, P. Tiwari, S. Bhatnagar, R. Bansal, A. Kumar, S. Gamanagati, R. Aggarwal, U. Baitha, A. Biswas, A. Kumar, P. Jorwal, Shalimar, A. Shariff, N. Wig, R. Subramaniam, A. Trikha, R. Malhotra, R. Guleria, V. Namboodiri, S. Banerjee, C. Arora, European Radiology, 31(8):6039-6048, 2021.
17. TIPS: Mining Top-K Locations to Minimize User-Inconvenience for Trajectory-Aware Services, Shubhadip Mitra, Priya Saraf, Arnab Bhattacharya, IEEE Transactions on Knowledge and Data Engineering, 33(3):1238-1250, 2021.
18. Calibrating feature maps for deep CNNs, Pravendra Singh, Pratik Mazumder, Mohammed Asad Karim, Vinay P. Namboodiri, Neurocomputing, 438:235-247, 2021.

## Journal Publications (continued)

19. Informative discriminator for domain adaptation, Vinod K.Kurmi, Venkatesh K.Subramanian, Vinay P. Namboodiri, Image and Vision Computing, 111:104180, 2021.
20. Robust non-parametric regression via incoherent subspace projections, B. Mukhoty, S. Dutta, P. Kar, Machine Learning, 110:2941-2989, 2021.
21. MUMC: Minimizing uncertainty of mixture of cues, B. N. Patro, V. K. Kurmi, S. Kumar, V. P. Namboodiri, Image and Vision Computing, 115:104280, 2021.
22. Few-shot image classification with composite rotation based self-supervised auxiliary task, P. Mazumder, P. Singh, V. P. Namboodiri, Neurocomputing, 489:179-195, 2022.
23. Discriminative semantic transitive consistency for cross-modal learning, Kranti Kumar Parida, Gaurav Sharma, Computer Vision and Image Understanding, 219:103404, 2022.
24. Sufficiently Informative and Relevant Features: An Information-theoretic and Fourier-based Characterization, Mohsen Heidari, Jithin K Sreedharan, Gil Shamir, and Wojciech Szpankowski, IEEE Transactions on Information Theory, 2022.
25. Over-precise predictions cannot identify good choice models, Anjali Sifar, Nisheeth Srivastava, Computational Brain and Behavior, 2022.

## Conference Publications

1. Swagrader: A honest effort extracting, modular peer-grading tool, Somu Prajapati, Ayushi Gupta, Shubham Kumar Nigam, Swaprava Nath, ACM CoDS-COMAD, 2020.
2. Predicting Body Size Using Mirror Selfies, Meet Sheth, Nisheeth Srivastava, International Conference on Intelligent Human Computer Interaction, 2020.
3. Incorporating syntactic and semantic information in word embeddings using graph convolutional networks, S. Vashishth, M. Bhandari, P. Yadav, P. Rai, C. Bhattacharyya, P. Talukdar, ACL, 2020.
4. Multimodal differential network for visual question generation, B. N. Patro, S. Kumar, V. K. Kurmi, V. P. Namboodiri, EMNLP, 2020.
5. Deep bayesian network for visual question generation, Badri N. Patro, Vinod K. Kurmi, Sandeep Kumar, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.

## Conference Publications (continued)

6. Accuracy booster: Performance boosting using feature map re-calibration, Pravendra Singh, Pratik Mazumder, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
7. Cooperative initialization based deep neural network training, Pravendra Singh, Munender Varshney, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
8. Can i teach a robot to replicate a line art, Raghav B. Venkataramaiyer, Subham Kumar, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
9. Robust explanations for visual question answering, Badri N. Patro, Shivansh Pate, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
10. A "network pruning network" Approach to deep model compression, Vinay Kumar Verma, Pravendra Singh, Vinay P. Namboodiri, Piyush Rai, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
11. Leveraging filter correlations for deep model compression, Pravendra Singh, Vinay Kumar Verma, Piyush Rai, Vinay P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
12. Bridged variational autoencoders for joint modeling of images and attributes, Ravindra Yadav, Ashish Sardana, Vinay P Namboodiri, Rajesh M Hegde, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
13. Jointly trained image and video generation using residual vectors, Yatin Dandi, Aniket Das, Soumye Singhal, Vinay P. Namboodiri, Piyush Rai, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
14. A generative framework for zero-shot learning with adversarial domain adaptation, Varun Khare, Divyat Mahajan, Homanga Bharadhwaj, Vinay Verma, Piyush Rai, IEEE Winter Conference on Applications of Computer Vision (WACV), 2020.
15. CPWC: Contextual Point Wise Convolution for Object Recognition, Pratik Mazumder, Pravendra Singh, Vinay Namboodiri, IEEE ICASSP, 2020.

## Conference Publications (continued)

16. A Multi-Task Music Artist Classification Network, Swaroop Panda, Vinay P. Namboodiri, International Conference on Computational Intelligence and Network (CINE), 2020.
17. MACER: A modular framework for accelerated compilation error repair, Darshak Chhatbar, Umair Z. Ahmed, Purushottam Kar, International Conference on Artificial Intelligence in Education (AIED), 2020.
18. Globally-convergent iteratively reweighted least squares for robust regression problems, Bhaskar Mukhoty, Govind Gopakumar, Prateek Jain, Purushottam Kar, International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.
19. SkillCheck: An Incentive-based Certification System using Blockchains, Jay Gupta, Swaprava Nath, IEEE International Conference on Blockchain and Cryptocurrency (ICBC), 2020.
20. SkipConv: Skip Convolution for Computationally Efficient Deep CNNs, Pravendra Singh, Vinay P. Namboodiri, IJCNN, 2020.
21. Passive Batch Injection Training Technique: Boosting Network Performance by Injecting Mini-Batches from a different Data Distribution, Pravendra Singh, Pratik Mazumder, Vinay P. Namboodiri, IJCNN, 2020.
22. T\* : A Heuristic Search Based Path Planning Algorithm for Temporal Logic Specifications, Danish Khalidi, Dhaval Gujarathi, Indranil Saha, IEEE International Conference on Robotics and Automation (ICRA), 2020.
23. Using conceptual incongruity as a basis for making recommendations, Tushar Shandhilya, Nisheeth Srivastava, RecSys, 2020.
24. How and Why is An Answer (Still) Correct? Maintaining Provenance in Dynamic Knowledge Graphs, G. Gaur, A. Bhattacharya, S. Bedathur, ACM CIKM, 2020.
25. Learning Individual Speaking Styles for Accurate Lip to Speech Synthesis, K R Prajwal, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2020.
26. Characterizing the pedagogical benefits of adaptive feedback for compilation errors by novice programmers, Umair Z. Ahmed, Nisheeth Srivastava, Renuka Sindhgatta, Amey Karkare, ICSE, 2020.

## Conference Publications (continued)

27. A multilingual parallel corpora collection effort for Indian languages, Shashank Siripragada, Jerin Philip, Vinay P. Namboodiri, C V Jawahar, LREC, 2020.
28. Stochastic talking face generation using latent distribution matching, Ravindra Yadav, Ashish Sardana, Vinay P Namboodiri, Rajesh M Hegde, INTERSPEECH, 2020.
29. Exploring State-of-the-Art Nearest Neighbor (NN) Search Techniques, Parth Nagarkar, Arnab Bhattacharya, Omid Jafari, ACM CoDS-COMAD, 2020.
30. Revisiting Low Resource Status of Indian Languages in Machine Translation, Jerin Philip, Shashank Siripragada, Vinay P. Namboodiri, C.V. Jawahar, ACM CoDS-COMAD, 2020.
31. FIRE 2020 AILA Track: Artificial Intelligence for Legal Assistance, Paheli Bhattacharya, Parth Mehta, Kripabandhu Ghosh, Saptarshi Ghosh, Arindam Pal, Arnab Bhattacharya, Prasenjit Majumder, Forum for Information Retrieval Evaluation AILA Track, 2020.
32. Learning to Switch CNNs with Model Agnostic Meta Learning for Fine Precision Visual Servoing, Prem Raj, Vinay P. Namboodiri, L. Behera, IEEE International Conference on Intelligent Robots and Systems (IROS), 2020.
33. Meta-learning for generalized zero-shot learning, Vinay Kumar Verma, Dhanajit Brahma, Piyush Rai, AAAI, 2020.
34. Deep attentive ranking networks for learning to order sentences, Pawan Kumar, Dhanajit Brahma, Harish Karnick, Piyush Rai, AAAI, 2020.
35. A Lip Sync Expert Is All You Need for Speech to Lip Generation in the Wild, K R Prajwal, Rudrabha Mukhopadhyay, Vinay Namboodiri, C V Jawahar, ACM International Conference on Multimedia (MM), 2020.
36. Visually Precise Query, Riddhiman Dasgupta, Francis Tom, Sudhir Kumar, Mithun Das Gupta, Yokesh Kumar, Badri N. Patro, Vinay P. Namboodiri, ACM International Conference on Multimedia (MM), 2020.
37. Explanation vs attention: A two-player game to obtain attention for VQA, Badri N. Patro, Anupriy, Vinay P. Namboodiri, AAAI, 2020.
38. P-SIF: Document embeddings using partition averaging, V. Gupta, A. Saw, P. Nokhiz, P. Netrapalli, P. Rai, P. Talukdar, AAAI, 2020.
39. Calibrating CNNs for lifelong learning, Pravendra Singh, Vinay Kumar Verma, Pratik Mazumder, Lawrence Carin, Piyush Rai, NeurIPS, 2020.



## Conference Publications (continued)

40. Characterizing the Pedagogical Benefits of Adaptive Feedback for Compilation Errors by Novice Programmers, Umair Z. Ahmed, Nisheeth Srivastava, Renuka Sindhgatta, Amey Karkare, ICSE-SEET, 2020.
41. Limits on Predictability of Risky Choice Behavior, Anjali Sifar, Nisheeth Srivastava, CogSci, 2020.
42. Inducing Preference Reversals by Manipulating Revealed Preferences, Harish Balakrishnan, Shobhit Jagga, Nisheeth Srivastava, CogSci, 2020.
43. Variational Autoencoders for Sparse and Overdispersed Discrete Data, He Zhao, Piyush Rai, Lan Du, Wray Buntine, Dinh Phung, and Mingyuan Zhou, International Conference on Artificial Intelligence and Statistics (AISTATS), 2020.
44. Emergent Road Rules In Multi-Agent Driving Environments, Avik Pal, Jonah Philion, Andrew Liao, Sanja Fidler, International Conference on Learning Representations (ICLR), 2020.
45. DECAF: Deep Extreme Classification with Label Features, A. Mittal, K. Dahiya, S. Agrawal, D. Saini, S. Agarwal, P. Kar, M. Varma, ACM WSDM, 2021.
46. Speech prediction in silent videos using variational autoencoders, R. Yadav, A. Sardana, V. P. Namboodiri, R. M. Hegde, IEEE ICASSP, 2021.
47. Visual speech enhancement without a real visual stream, S. B. Hegde, K. R. Prajwal, R. Mukhopadhyay, V. Namboodiri, C. V. Jawahar, IEEE Winter Conference on Applications of Computer Vision (WACV), 2021.
48. Multimodal humor dataset: Predicting laughter tracks for sitcoms, B. N. Patro, M. Lunayach, D. Srivastava, S. Sarvesh, H. Singh, V. P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2021.
49. Improving few-shot learning using composite rotation based auxiliary task, P. Mazumder, P. Singh, V. P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2021.
50. SHAD3S: A model to sketch, shade and shadow, R. B. Venkataramaiyer, A. Joshi, S. Narang, V. P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2021.
51. Self supervision for attention networks, B. N. Patro, Kasturi S. G, A. Jain, V. P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2021.

## Conference Publications (continued)

52. Sangrahaka: A tool for annotating and querying knowledge graphs, H. Terdalkar, A. Bhattacharya, ACM Joint Meeting European Software Engineering Conference and Symposium on the Foundations of Software (ESEC/FSE), 2021.
53. Computing and Maintaining Provenance of Query Result Probabilities in Uncertain Knowledge Graphs, G. Gaur, A. Dang, A. Bhattacharya, S. Bedathur, ACM CIKM, 2021.
54. VerSaChI: Finding Statistically Significant Subgraph Matches using Chebyshev's Inequality, S. Agarwal, S. Dutta, A. Bhattacharya, ACM CIKM, 2021.
55. Towards automatic speech to sign language generation, P. Kapoor, R. Mukhopadhyay, S. B. Hegde, V. Namboodiri, C. V. Jawahar, INTERSPEECH, 2021.
56. Translating sign language videos to talking faces, S. Mazumder, R. Mukhopadhyay, V. P. Namboodiri, C. V. Jawahar, Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), 2021.
57. Intelligent video editing: Incorporating modern talking face generation algorithms in a video editor, A. Gupta, F. F. Khan, R. Mukhopadhyay, V. P. Namboodiri, C. V. Jawahar, Indian Conference on Computer Vision, Graphics and Image Processing (ICVGIP), 2021.
58. Fine-Grained Emotion Prediction by Modeling Emotion Definitions, G. Singh, D. Brahma, P. Rai, A. Modi, International Conference on Affective Computing and Intelligent Interaction (ACII), 2021.
59. AILA 2021: Shared task on Artificial Intelligence for Legal Assistance, V. Parikh, U. Bhattacharya, P. Mehta, A. Bandyopadhyay, P. Bhattacharya, K. Ghosh, S. Ghosh, A. Pal, A. Bhattacharya, P. Majumder, Forum for Information Retrieval Evaluation AILA Track, 2021.
60. DT\*: Temporal Logic Path Planning in a Dynamic Environment, P. Purohit, I. Saha, IEEE International Conference on Intelligent Robots and Systems (IROS), 2021.
61. Mobile Recharger Path Planning and Recharge Scheduling in a Multi-Robot Environment, T. Kundu, I. Saha, IEEE International Conference on Intelligent Robots and Systems (IROS), 2021.
62. OMCoRP: An Online Mechanism for Competitive Robot Prioritization, S. N. Das, S. Nath, I. Saha, International Conference on Automated Planning and Scheduling (ICAPS), 2021.

## Conference Publications (continued)

63. Knowledge Consolidation based Class Incremental Online Learning with Limited Data, M. A. Karim, V. K. Verma, P. Singh, V. Namboodiri, P. Rai, International Joint Conference on Artificial Intelligence (IJCAI), 2021.
64. Imprecise Oracles Impose Limits to Predictability in Supervised Learning (Extended Abstract), A. Sifar, N. Srivastava, International Joint Conference on Artificial Intelligence (IJCAI), 2021.
65. OntoSeer: A Tool to Ease the Ontology Development Process, Pramit Bhattacharyya, Raghava Mutharaju, ACM CoDS-COMAD, 2021.
66. SMT-Based Optimal Deployment of Mobile Robot Rechargers, Tanmoy Kundu, Indranil Saha, IEEE International Conference on Robotics and Automation (ICRA), 2021.
67. Opening the Blackbox: Accelerating Neural Differential Equations by Regularizing Internal Solver Heuristics, Avik Pal, Yingbo Ma, Viral Shah, Christopher Rackauckas, International Conference on Machine Learning (ICML), 2021.
68. One and known: Incidental probability judgments from very few samples, Ishan Singhal, Narayanan Srinivasan, Nisheeth Srivastava, CogSci, 2021.
69. Modeling procrastination as rational metareasoning about task effort, Shobhit Jagga, Narayanan Srinivasan, Nisheeth Srivastava, CogSci, 2021.
70. A Decentralized Reinforcement Learning System for Patrol Routing, Avijit Roy, Nisheeth Srivastava, International Conference on Automated Planning and Scheduling (ICAPS), 2021.
71. ECLARE: Extreme Classification with Label Graph Correlations, Anshul Mittal, Noveen Sachdeva, Sheshansh Agrawal, Sumeet Agarwal, Purushottam Kar, and Manik Varma, The Web Conference (WWW), 2021.
72. SiameseXML: Siamese Networks meet Extreme Classifiers with 100M Labels, Kunal Dahiya, Ananye Agarwal, Deepak Saini, Gururaj K, Jian Jiao, Amit Singh, Sumeet Agarwal, Purushottam Kar, and Manik Varma, International Conference on Machine Learning (ICML), 2021.
73. Beyond Image to Depth: Improving Depth Prediction using Echoes, Kranti Kumar Parida, Siddharth Srivastava, Gaurav Sharma, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021.



## Conference Publications (continued)

74. GraphReach: Position-Aware Graph Neural Network using Reachability Estimations, Sunil Nishad, Shubhangi Agarwal, Arnab Bhattacharya, Sayan Ranu, International Joint Conference on Artificial Intelligence (IJCAI), 2021.
75. ILDC for CJPE: Indian Legal Documents Corpus for Court Judgment Prediction and Explanation, Vijit Malik, Rishabh Sanjay, Shubham Kumar Nigam, Kripabandhu Ghosh, Shouvik Kumar Guha, Arnab Bhattacharya, Ashutosh Modi, Annual Meeting of the Association for Computational Linguistics and the International Joint Conference on Natural Language Processing (ACL- IJCNLP), 2021.
76. Prediction of CardioVascular Disease (CVD) using Ensemble Learning Algorithms, Oswald , G. J. Sathwika, A. Bhattacharya, ACM CoDS-COMAD, 2022.
77. AGGLIO: Global Optimization for Locally Convex Functions, D. Dey, B. Mukhoty, P. Kar, ACM CoDS-COMAD, 2022.
78. Fair Visual Recognition in Limited Data Regime using Self-Supervision and Self-Distillation, P. Mazumder, P. Singh, V. P. Namboodiri, IEEE Winter Conference on Applications of Computer Vision (WACV), 2022.
79. Privacy-Preserving Record Linkage with Block-Chains, A. Jain, N. Srivastava, International Conference on Cyber Security, Privacy and Networking, 2022.
80. LEARNING TO PREDICT SPEECH IN SILENT VIDEOS VIA AUDIOVISUAL ANALOGY, R. Yadav, A. Sardana, V. P. Namboodiri, R. M. Hegde, IEEE ICASSP, 2022.
81. Selecting between visuomotor lotteries to measure mental effort in risky decisions, Samarth Mehrotra, Nisheeth Srivastava, CogSci, 2022.
82. Beyond Mono to Binaural: Generating Binaural Audio from Mono Audio with Depth and Cross Modal Attention, Kranti Kumar Parida, Siddharth Srivastava, Gaurav Sharma, IEEE Winter Conference on Applications of Computer Vision (WACV), 2022.
83. IGLU: Efficient GCN Training via Lazy Updates, S Deepak Narayanan, Aditya Sinha, Prateek Jain, Purushottam Kar, Sundararajan Sellamanickam, International Conference on Learning Representations (ICLR), 2022.

## Conference Publications (continued)

84. Multi-modal Extreme Classification, Anshul Mittal, Kunal Dahiya, Shreya Malani, Janani Ramaswamy, Seba Kuruvilla, Jitendra Ajmera, Keng-Hao Chang, Sumeet Agarwal, Purushottam Kar, Manik Varma, IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2022.
85. Learning Speaker-specific Lip-to-Speech Generation, Munender Varshney, Ravindra Yadav, Vinay Namboodiri, Rajesh Hegde, International Conference on Pattern Recognition (ICPR), 2022.
86. Sampling-based probability construction explains individual differences in risk preference, Ankoju Bhanu Prakash, Nisheeth Srivastava, CogSci, 2022.
87. Adapting a Language Model for Controlled Affective Text Generation, Tushar Goswamy, Ishika Singh, Ahsan Barkati, Ashutosh Modi, International Conference on Computational Linguistics (COLING), 2020.
88. Adv-OLM: Generating Textual Adversaries via OLM, Vijit Malik, Ashwani Bhat, Ashutosh Modi, Conference of the European Chapter of the Association for Computational Linguistics (EACL), 2021.
89. Pre-trained Language Models as Prior Knowledge for Playing Text-based Games, Ishika Singh, Gargi Singh, Ashutosh Modi, International Conference on Autonomous Agents and MultiAgent Systems (AAMAS), 2022.
90. COGMEN: COntextualized GNN based Multimodal Emotion recognition, Abhinav Joshi, Ashwani Bhat, Ayush Jain, Atin Vikram Singh, Ashutosh Modi, Conference of the North American Chapter of the Association for Computational Linguistics (NAACL), 2022.
91. Corpus for Automatic Structuring of Legal Documents, Prathamesh Kalamkar, Aman Tiwari, Astha Agarwal, Saurabh Karn, Smita Gupta, Vivek Raghavan, Ashutosh Modi, Language Resources and Evaluation Conference (LREC), 2022.

## Workshop Publications

1. Minimizing supervision in multi-label categorization, Rajat, Munender Varshney, Pravendra Singh, Vinay P. Namboodiri, CVPR Workshops, 2020.
2. A recommender system for informal bibliotherapy, J. Aswal, Nisheeth Srivastava, CEUR Workshops, 2020.

## Workshop Publications (continued)

3. Overview of the FIRE 2020 AILA track: Artificial intelligence for legal assistance, P. Bhattacharya, P. Mehta, K. Ghosh, S. Ghosh, A. Pal, A. Bhattacharya, P. Majumder, CEUR Workshop Proceedings, 2020.
4. Auto QA: The Question Is Not only What, but Also Where, S. Kumar, B. N. Patro, V. P. Namboodiri, IEEE/CVF WACV-Workshops, 2022.
5. VQuAD: Video Question Answering Diagnostic Dataset, V. Gupta, B. N. Patro, H. Parihar, V. P. Namboodiri, IEEE/CVF WACV-Workshops, 2022.
6. Makadi: A Large-Scale Human-Labeled Dataset for Hindi Semantic Parsing, Shashwat Vaibhav, Nisheeth Srivastava, Workshop on Indian Language Data: Resources and Evaluation (WILDRE), 2022.
7. problemConquero at SemEval-2020 Task 12: Transformer and Soft Label-based Approaches, Karishma Laud, Jagriti Singh, Randeep Kumar Sahu, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
8. newsSweeper at SemEval-2020 Task 11: Context-Aware Rich Feature Representations for Propaganda Classification, Paramansh Singh, Siraj Sandhu, Subham Kumar, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
9. IITK-RSA at SemEval-2020 Task 5: Detecting Counterfactuals, Anirudh Anil Ojha, Rohin Garg, Shashank Gupta, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
10. CS-NET at SemEval-2020 Task 4: Siamese BERT for ComVE, Soumya Ranjan Dash, Sandeep Routray, Prateek Varshney, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
11. IITK at SemEval-2020 Task 8: Unimodal and Bimodal Sentiment Analysis of Internet Memes, Vishal Keswani, Sakshi Singh, Suryansh Agarwal, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
12. BAKSA at SemEval-2020 Task 9: Bolstering CNN with Self-Attention for Sentiment Analysis of Code Mixed Text, Ayush Kumar, Harsh Agarwal, Keshav Bansal, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.
13. IITK at SemEval-2020 Task 10: Transformers for Emphasis Selection, Vipul Singhal, Sahil Dhull, Rishabh Agarwal, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@COLING), 2020.

## Workshop Publications (continued)

14. IITK at the FinSim Task: Hypernym Detection in Financial Domain via Context-Free and Contextualized Word Embeddings, Vishal Keswani, Sakshi Singh, Ashutosh Modi, Workshop on Semantic Evaluation (FinNLP@COLING), 2020.
15. Humor@IITK at SemEval-2021 Task 7: Large Language Models for Quantifying Humor and Offensiveness, Aishwarya Gupta, Avik Pal, Bholeshwar Khurana, Lakshay Tyagi, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
16. IITK@LCP at SemEval-2021 Task 1: Classification for Lexical Complexity Regression Task, Neil Shirude, Sagnik Mukherjee, Tushar Shandhilya, Ananta Mukherjee, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
17. MCL@IITK at SemEval-2021 Task 2: Multi-Lingual and Cross-Lingual Word in Context Disambiguation using Augmented Data, Signals, Transformers, Rohan Gupta, Jay Mundra, Deepak Mahajan, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
18. KnowGraph@IITK at SemEval-2021 Task 11: Building Knowledge Graph for NLP Research, Shashank Shailabh, Sajal Chaurasia, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
19. IITK at SemEval-2021 Task 10: Source-Free Unsupervised Domain Adaptation using Class Prototypes, Harshit Kumar, Jinang Shah, Nidhi Hegde, Priyanshu Gupta, Vaibhav Jindal, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
20. BreakingBERT@IITK at SemEval-2021 Task 9: Statement Verification and Evidence Finding with Tables, Aditya Jindal, Ankur Gupta, Jaya Srivastava, Preeti Menghwani, Vijit Malik, Vishesh Kaushik, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
21. IITK@Detox at SemEval-2021 Task 5: Semi-Supervised Learning and Dice Loss for Toxic Spans Detection, Archit Bansal, Abhay Kaushik, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
22. ReCAM@IITK at SemEval-2021 Task 4: BERT and ALBERT based Ensemble for Abstract Word Prediction, Abhishek Mittal and Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.
23. Counts@IITK at SemEval-2021 Task 8: SciBERT Based Entity And Semantic Relation Extraction For Scientific Data, Akash Gangwar, Sabhay Jain, Shubham Sourav, Ashutosh Modi, Workshop on Semantic Evaluation (SemEval@ACL/IJCNLP), 2021.

## Workshop Publications (continued)

24. An End-to-End Network for Emotion-Cause Pair Extraction, Aaditya Singh, Shreeshail Hingane, Saim Wani, Ashutosh Modi, Workshop on Computational Approaches to Subjectivity, Sentiment and Social Media Analysis (WASSA@EMNLP), 2021.
25. HLDC: Hindi Legal Documents Corpus, Arnav Kapoor, Mudit Dhawan, Anmol Goel, T. H. Arjun, Akshala Bhatnagar, Vibhu Agrawal, Amul Agrawal, Arnab Bhattacharya, Ponnurangam Kumaraguru, Ashutosh Modi, Findings of the Association for Computational Linguistics (Findings@ACL), 2022.

## Invited Talks and Seminars

Title: *InfoTabS - Inference on Tables as Semi-structured data*

Speaker: Vivek Gupta, PhD candidate, School of Computing, University of Utah

Date: January 3rd, 2020

Title: *Voice for the Voiceless: Active Sampling to Detect Comments Supporting the Rohingyas*

Speaker: Ashique KhudaBukhsh, Project Scientist, School of Computer Science, CMU

Date: January 10th, 2020

Title: *Neural Module Networks for Reasoning over Text*

Speaker: Nitish Gupta, Ph.D. candidate, University of Pennsylvania

Date: January 10th, 2020

Title: *Learning to Create Data*

Speaker: Amlan Kar, Ph.D. candidate, University of Toronto

Date: January 13th, 2020

Title: *Medical Imaging Informatics and Artificial Intelligence: An opportunity to democratize innovation in medicine*

Speaker: Dr. Bishesh Khanal, Research Scientist and Chairperson, NAAMII

Date: January 14th, 2020

Title: *Wadhwani AI: AI for Social Good*

Speaker: Dr. Alpan Raval, Head of Data Science, Wadhwani Institute for Artificial Intelligence

Date: January 16th, 2020

Title: *Bayesian Optimisation and Applications*

Speaker: Dr. Sunil Gupta, Associate Professor, Applied Artificial Intelligence Institute (A2I2), Deakin University, Australia

Date: January 17th, 2020



## Invited Talks and Seminars (continued)

Title: *Text is not Text: Challenges in deep text understanding in professional domains*

Speaker: Dr. Vijay Saraswat, MD and Global Head of AI R&D, Goldman-Sachs, New York

Date: January 21st, 2020

Title: *Age of Information: Analysis and Optimization*

Speaker: Jaya Prakash Champati, Post-doctoral Researcher, KTH Royal Institute of Technology, Sweden

Date: February 4th, 2020

Title: *Post Facto Cambridge Analytica: AI for Social Good*

Speaker: Dr. Amitava Das, Lead Scientist, Wipro AI Lab, Bangalore

Date: February 6th, 2020

Title: *How do offenders select their targets? Agent-Based modeling approach*

Speaker: Dr. Arvind Verma, Professor of Criminology, Indiana University

Date: February 7th, 2020

Title: *Fairness in Algorithmic Decision Making*

Speaker: Dr Abhijnan Chakraborty, Post-doctoral Researcher, Max Planck Institute for Software Systems, Germany

Date: March 3rd, 2020

Title: *Applying AI to enable the Right Career for Everyone in the World*

Speaker: Mr. Vinodh Kumar Ravindranath, Head of AI & Engineering, Eightfold.ai

Date: September 17th, 2020

Title: *A Computational Approach towards Incentives in Social Choice*

Speaker: Dr Rohit Vaish, Tata Institute of Fundamental Research (TIFR)

Date: June 17th, 2021

Title: *Deep Neural Networks for Resource Constraint IoT Devices*

Speaker: Dr Khalid Pandit, National Institute of Technology, Srinagar

Date: July 15th, 2021

## Invited Talks and Seminars (continued)

Title: *PAC learning high dimensional distributions*

Speaker: Dr Sutanu Gayen (NUS), Postdoctoral Research Fellow, NUS

Date: August 10th, 2021

Title: *Interpretable Machine Learning: Theory and Practice*

Speaker: Dr Rajiv Khanna, Assistant Professor, Purdue University

Date: September 8th, 2021

Title: *Scalable dimensionality reduction algorithms for Big Data*

Speaker: Dr Rameshwar Pratap Yadav, Assistant Professor, IIT Mandi

Date: January 11th, 2022

Title: *Anticipating human actions*

Speaker: Dr. Debaditya Roy, Research Scientist, A\*STAR, Singapore

Date: February 15th, 2022

Title: *Simplicity Bias in Deep Learning*

Speaker: Prateek Jain, Google AI

Date: February 18th, 2022

Title: *Efficient Knowledge Extraction and Visual Analytics of Big Data at Scale*

Speaker: Soumya Dutta, Scientist-2, LANL

Date: March 3rd, 2022

Title: *Application of Digital Microfluidic Biochip and Machine Learning in the domain of Biomedical Engineering*

Speaker: Dr Pampa Howladar, IEST Shibpur

Date: March 3rd, 2022

Title: *Analyzing Code Corpora to Improve the Correctness and Reliability of Programs*

Speaker: Jibesh Patra, Software Engineer, SAP

Date: March 8th, 2022



## Invited Talks and Seminars (continued)

Title: *Improving Software Quality Using Natural Language Artifacts*

Speaker: Manish Motwani, PhD candidate, University of Massachusetts Amherst

Date: March 10th, 2022

Title: *Bias in Algorithms*

Speaker: Dr. Nisheeth Vishnoi, Yale University

Date: March 21st, 2022

Title: *Causal Machine Learning: A path towards out-of-distribution generalization and fairness*

Speaker: Dr. Amit Sharma, Principal Researcher, Microsoft Research India

Date: March 25th, 2022

## Acknowledgments

We are thankful to the following for their help in putting together this report

1. Staff members of the CSE department office
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6. Staff members of the office of the Dean of Faculty Affairs



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Designed by Purushottam Kar on MS PowerPoint

**Email:** [purushot@cse.iitk.ac.in](mailto:purushot@cse.iitk.ac.in)

**Web:** [www.cse.iitk.ac.in/users/purushot](http://www.cse.iitk.ac.in/users/purushot)

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