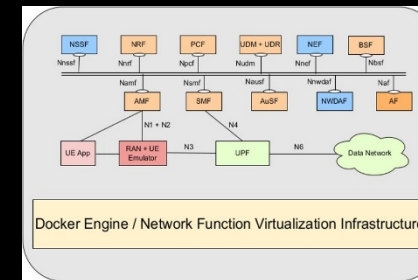




### Major Areas of Research/Up to 3 major sponsored projects

1. Next Generation Mobile Networks (5G and Beyond)
2. Multi-Access Edge Computing
3. Cloud Radio Access Networks
4. SDN/NFV
5. V2X



### Major Research Facilities in the Group

1. IITH 5G Core Testbed with MEC support and RAN+UE Emulator
2. High end workstations and servers, whiebox switches, etc.
3. SDR Boards for 4G/5G RAN using OAI
4. V2X Development Boards



### Technology/Product Developed/Up to 3 most significant Publications

1. IITH 5G Core with Support for MEC, Network Slicing, and Orchestration
2. S. Vittal and A. A. Franklin, "HARNESS: High Availability Supportive Self Reliant Network Slicing in 5G Networks," in IEEE Transactions on Network and Service Management, vol. 19, no. 3, pp. 1951-1964, Sept. 2022.
3. Shashwat Kumar, Sai Vineeth Doddala, A. Antony Franklin, Jiong Jin, RAN-aware adaptive video caching in multi-access edge computing networks, Journal of Network and Computer Applications, Volume 168, 2020
4. V. R. Chintapalli, S. B. Korrapati, B. R. Tamma and A. F. A, "NUMASFP: NUMA-Aware Dynamic Service Function Chain Placement in Multi-Core Servers," COMSNETS 2022, pp. 181-189. (Best Paper Award)

# N.R.Aravind

## Associate Professor, Theory Group, CSE

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### Major Areas of Research:

Parameterized Algorithms, Random Graphs, Graph coloring

### Major Research Facilities in the Group:

N/A

### 3 most significant Publications:

Dichotomy Results on the Hardness of H-free Edge Modification problems, SIAM J. Disc Math, 2017

On Polynomial Kernelization of H-free Edge Deletion, Algorithmica, 2017

An FPT Algorithm for Matching Cut and d-Cut, IWOCA 2021

#### Dichotomy Results on the Hardness of $H$ -free Edge Modification Problems

N. R. Aravind, R. B. Sandeep, and Naveen Sivadasan

<https://doi.org/10.1137/16M1055797>



SECTIONS



#### Abstract

For a graph  $H$ , the  $H$ -free Edge Deletion problem asks whether there exist at most  $k$  edges whose deletion from the input graph  $G$  results in a graph without any induced copy of  $H$ .  $H$ -free Edge Completion and  $H$ -free Edge Editing are defined similarly where only completion (addition) of edges are allowed in the former and both completion and deletion are allowed in the latter. We completely settle the classical complexities of these problems by proving that  $H$ -free Edge Deletion is NP-complete if and only if  $H$  is a graph with at least two edges,  $H$ -free Edge Completion is NP-complete if and only if  $H$  is a graph with at least two nonedges, and  $H$ -free Edge Editing is NP-complete if and only if  $H$  is a graph with at least three vertices. Our result on  $H$ -free Edge Editing resolves a conjecture by Alon and Stav [Theoret. Comput. Sci., 2009, pp. 4920--4927]. Additionally, we prove that these NP-complete problems cannot be solved in parameterized subexponential time, i.e., in time  $2^{o(k)} \cdot |G|^{O(1)}$ , unless the exponential time hypothesis fails. Furthermore, we obtain implications on the incompressibility and the inapproximability of these problems.

#### Keywords

$H$ -free edge modification, NP-completeness, parameterized lower bounds

# Bheemarjuna Reddy Tamma

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## Major Areas of Research

Wireless Networks, Network Security

Mobile Edge Computing, C-V2X, Quantum Internet

## Major Research Facilities in the Group

Programmable 5G Cloud RAN testbed

SDN Switches, USRP SDR boards

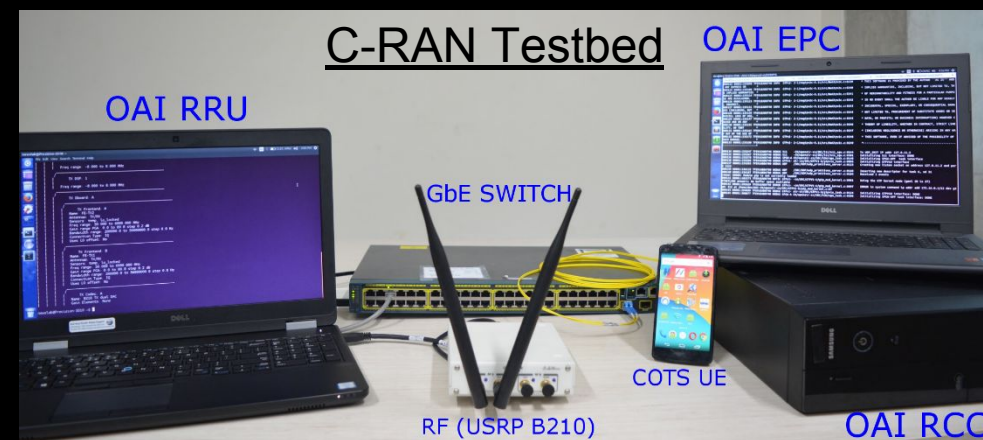
High-end Servers and workstations

## Technology/Product Developed

LWIP: LTE-Wi-Fi Radio Level Interworking System

FENCE: Privacy-Preserving Enterprise Internet Forensics at Scale

Open source contributions on LWIP, Network Intrusion Detection using AI/ML, Intelligent energy saving in data centres using BMaaS under-cloud, and 5G SBA Core using SDN/NFV



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Indian Institute of Technology Hyderabad

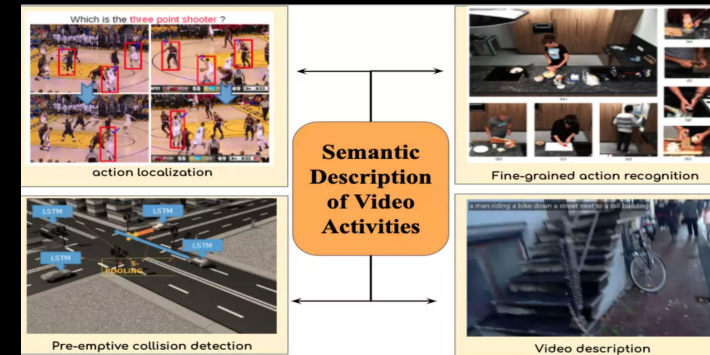


## Major Areas of Research/Up to 3 major sponsored projects

- Action recognition, emotion recognition and video analytics
- Computer vision for autonomous vehicle technology
- Aerial imagery analysis and image/video captioning
- Medical imaging

## Major Research Facilities in the Group

- Workstation consisting of four Nvidia A6000 GPU cards each with 48GB RAM.
- Three workstations each consisting of 32GB Nvidia Tesla series GPU cards.
- Four 24GB RAM Nvidia Quadro series GPU cards



**IIT-H develops AI-enabled software to catch bike riders without helmet**

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Hyderabad: Artificial intelligence (AI) may soon help law-enforcing agencies crack down on people riding without a helmet in the city. Researchers at Indian Institute of Technology (IIT), Hyderabad, have developed an AI-enabled detection system which will identify motorcyclists riding without helmet, using CCTV network of traffic police, in real time.

After a two-year effort, a team of three researchers — associate professor Krishna Mohan, his students Dinesh Singh and C Vishnu — has developed a software to detect people riding without helmet. The researchers accessed traf-

**BRAINS BEHIND AI**

From left: Mohan, Dinesh and Vishnu

► Researchers used machine learning and AI techniques to develop the software, which would be partially installed in CCTVs

► Technology was tested at IIT-Hyderabad and some traffic junctions, where in it threw up positive results

► They accessed traffic data of city's CCTV network to develop software to help cops identify violators in real time

► The researchers used machine learning and AI techniques to develop the software, which would be partially installed in CCTV cameras along with an embedded card to respect servers.

► The technology was tested by the researchers at IIT-Hyderabad and some traffic junctions, where in it threw up positive results.

► Using video surveillance (CCTV network), the software will identify riders driving without helmet and send out an alert to the control room within 10-11 milliseconds. Subse-

► Identification in real time: PS

## Technology/Product Developed/Up to 3 most significant Publications

- Prudviraj Jeripothula, Chalavadi Vishnu, C Krishna Mohan, "AAP-MIT: Attentive Atrous Pyramid Network and Memory Incorporated Transformer for Multi-Sentence Video Description", IEEE Transactions on Image Processing, <https://doi.org/10.1109/TIP.2022.3195643>, 2022.
- Inayathullah Ghorri, & Debaditya Roy, Renu John, and C Krishna Mohan, "Echocardiogram Analysis using Motion Profile Modeling," *IEEE Transactions on Medical Imaging*, vol. 39, no. 5, pp. 1767-1774, <https://doi.org/10.1109/tmi.2019.2957290>, 2019.
- Nazil Perveen, Debaditya Roy and C Krishna Mohan, "Facial Expression Recognition in Videos using Dynamic Kernels," IEEE Transactions on Image Processing, vol. 29, pp. 8316-8325, 10.1109/TIP.2020.3011846, 2020.



## Major Areas of Research/Up to 3 major sponsored projects

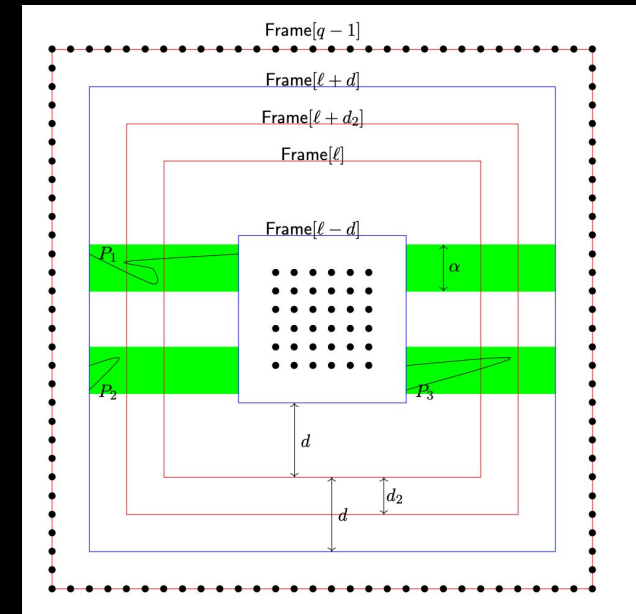
Parameterized Algorithms and  
Complexity Approximation Algorithms  
Streaming Algorithms

## Major Research Facilities in the Group

GPU Workstation with NVIDIA A6000

## Three most significant Publications

- Deleting, Eliminating and Decomposing to Hereditary Classes Are All FPT-Equivalent.**  
*In SODA 2022.* With A. Agrawal, L. Kanesh, D. Lokshantov, M.S. Ramanujan, S. Saurabh, M. Zehavi.
- Lossy kernelization.**  
*In STOC 2017.* With D. Lokshantov, M.S. Ramanujan, S. Saurabh.
- Efficient Computation of Representative Families with Applications in Parameterized and Exact Algorithms.**  
*In JACM 2016.* With F. V. Fomin, D. Lokshantov, S. Saurabh.



# J. Saketha Nath

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- Machine Learning
  - Kernel methods, Learning theory and optimization
- Fujitsu project on Causal ML (~1.1 Cr)
- Google PhD Student Award (~37 La)
- Microsoft gift (~12 La)
- [Chance constrained uncertain classification via robust optimization](#). *Mathematical Programming*.
- [Maximum mean discrepancy for class ratio estimation: Convergence bounds and kernel selection](#). *ICML*.
- [On the algorithmics and applications of a mixed-norm based kernel learning formulation](#). *NeurIPS*.



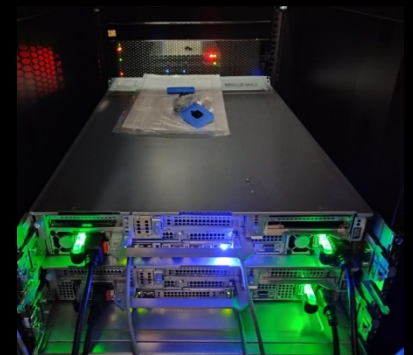
### Major Areas of Research/Up to 3 major sponsored projects

1. Towards High Programmer Productivity Using AI and Program Analysis (Funded by Microsoft Research + Seed grant)
2. Compiler Optimizations for GPU programs
3. High-performant Large-scale Graph Algorithms on GPUs



### Major Research Facilities in the Group

1. Server Node with 2 x Nvidia A100 40GB GPU cards and dual CPU Processor, each with 16C
2. Server Node with dual CPU processor, each with 16C



### Technology/Product Developed/Up to 3 most significant Publications

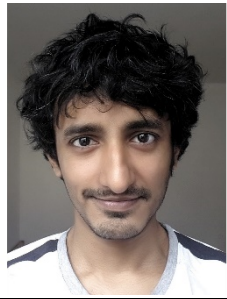
1. Tool for Automatic Code Comprehension of Data Science Notebooks
2. LLVM Compiler Implementation for GSOHC: Global Synchronization Optimization in Heterogeneous Computing

# Kartek Sreenivasaiah

## Assistant Professor, Computer Science and Engineering



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### Major Areas of Research/Up to 3 major sponsored projects

Computational Complexity  
Algorithms  
Theoretical Computer Science

### Major Research Facilities in the Group

### Technology/Product Developed/Up to 3 most significant Publications

Nutan Limaye, Kartek Sreenivasaiah, Srikanth Srinivasan, Utkarsh Tripathi, S. Venkitesh:  
*A Fixed-Depth Size-Hierarchy Theorem for  $AC_0[+]$  via the Coin Problem*. SIAM J. Comput.  
50(4): 1461-1499 (2021)

Christian Ikenmeyer, Balagopal Komarath, Christoph Lenzen, Vladimir Lysikov, Andrey  
Mokhov, Kartek Sreenivasaiah: *On the Complexity of Hazard-free Circuits*. J. ACM 66(4):  
25:1-25:20 (2019)



# M. V. Panduranga Rao

## Associate Professor, CSE




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## Quantum Computing and Communications Formal Methods: Theory and Applications Algorithms and Complexity

### Recent Papers (2022):

1. **Statistical Model Checking for Probabilistic Temporal Epistemic Logics.** ICAART (1) 2022: 53-63 (with Yenda Ramesh)
2. **Model Checking for Entanglement Swapping.** FORMATS 2022: 98-114, with Surya Sai Teja Desu, Anubhav Srivastava
1. **Quantum learning of concentrated Boolean functions.** Quantum Inf. Process. 21(7): 256 (with Krishna Palem and Duc Hung Pham,



International Conference on Formal Modeling and Analysis of Timed Systems  
↳ FORMATS 2022: **Formal Modeling and Analysis of Timed Systems** pp 98-114 | [Cite as](#)

### Model Checking for Entanglement Swapping

[Surya Sai Teja Desu](#), [Anubhav Srivastava](#) & [M. V. Panduranga Rao](#) ✉

Conference paper | [First Online: 29 August 2022](#)  
157 Accesses

Part of the [Lecture Notes in Computer Science](#) book series (LNCS, volume 13465)

#### Abstract

Entanglement swapping is a basic primitive in long distance quantum communications. The stochastic nature of various operations like entanglement generation and BSMs makes the entanglement swapping primitive failure prone. It is difficult to predict whether or not an entanglement swapping operation will succeed within a stipulated time. In this paper, we use Probabilistic Timed Automata (PTA) to model the experiment and analyze it through model checking. We report a proof-of-concept mechanism, opening way for the analysis of large scale quantum networks through formal methods. We also report supporting results on a quantum simulator.

#### Keywords

Entanglement Swapping   Quantum Networks   Probabilistic Timed Automata  
Quantum Network Simulators



# Maria Francis

Assistant Professor, Computer Science & Engineering



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Indian Institute of Technology Hyderabad



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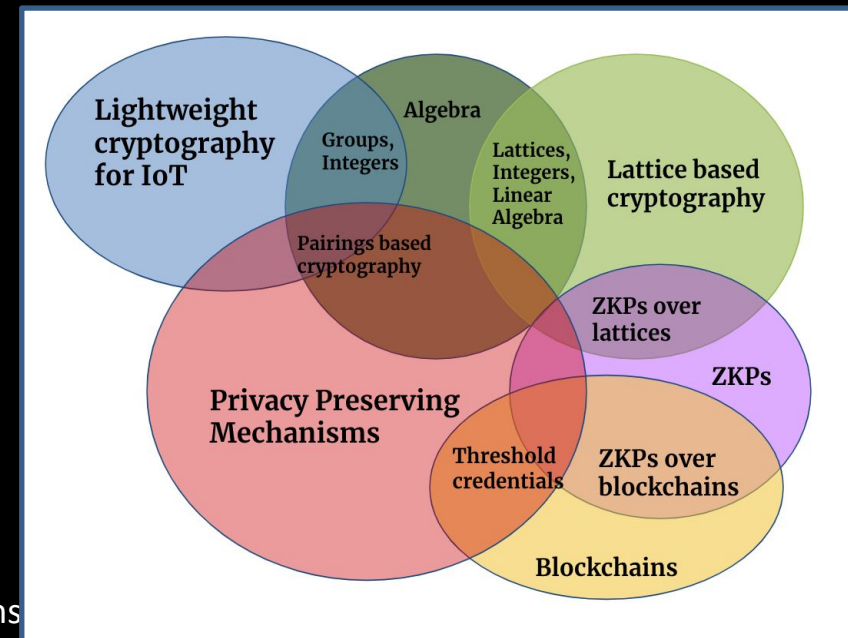
Webpage: <https://sites.google.com/view/maria-francis>

## Major Areas of Research

- Privacy preserving mechanisms over blockchains
- Lightweight cryptography for IoT
- Lattice-based cryptography
- Computational algebra

## Major Research Facilities in the Group

Our work focuses mainly on theoretical results and prototype implementations which do not require any special facilities.



## Technology/Product Developed/Up to 3 most significant Publications

1. A. Naaz, T. V. Pavan Kumar B, M. Francis and K. Kataoka, "Integrating Threshold Opening With Threshold Issuance of Anonymous Credentials Over Blockchains for a Multi-Certifier Communication Model," in IEEE Access, vol. 10, pp. 128697-128720, 2022.
2. M. Francis and T. Verron. "On Two Signature Variants Of Buchberger's Algorithm Over Principal Ideal Domains", International Symposium on Symbolic and Algebraic Computation (ISSAC) 2021.
3. M. Francis and A. Dukkupati. "On Ideal Lattices, Gröbner Bases and Generalized Hash Functions ", Journal of Algebra and its Applications, Vol. 17, No. 06, 1850112 (2018).

# Dr. Maunendra Sankar Desarkar

## Associate Professor, Department of CSE



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## Major Areas of Research/Up to 3 major sponsored projects

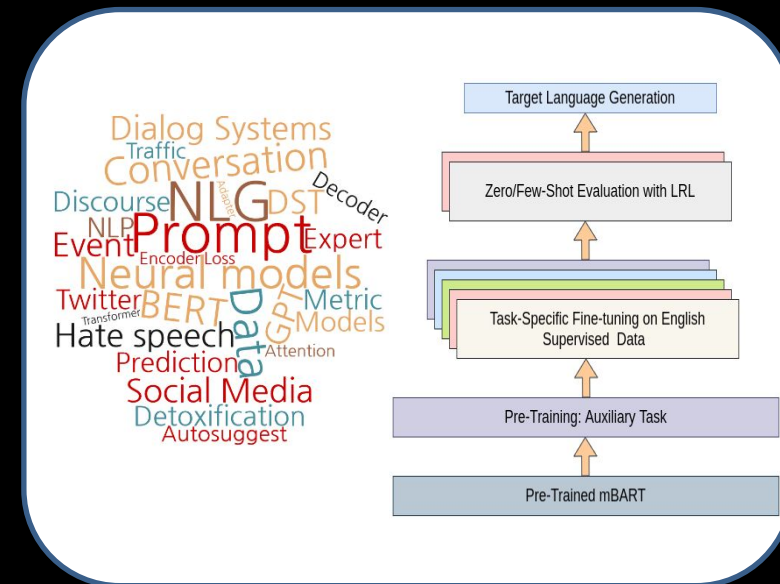
Major areas of work: NLP, Recommendation Systems, Information Retrieval

### Projects:

- Zero-shot Multi-lingual Personalized Auto-suggest Generation
- M2SMART SATREPS Project: Multimodal Regional Transport System - Smart Cities for Emerging Countries based on Sensing, Networking, and Big Data Analysis.

## Major Research Facilities in the Group

Servers and GPU Powered workstations



## Technology/Product Developed/Up to 3 most significant Publications

- Kaushal Kumar Maurya, Maunendra Sankar Desarkar, Yoshinobu Kano, Kumari Deepshikha: ZmBART: An Unsupervised Cross-lingual Transfer Framework for Language Generation. ACL/IJCNLP (Findings) 2021: 2804-2818
- Suvodip Dey, Maunendra Sankar Desarkar: Hi-DST: A Hierarchical Approach for Scalable and Extensible Dialogue State Tracking. SIGDIAL 2021: 218-227
- Samujjwal Ghosh, Subhadeep Maji and Maunendra Sankar Desarkar, "Unsupervised Domain Adaptation With Global and Local Graph Neural Networks Under Limited Supervision and Its Application to Disaster Response," in IEEE Transactions on Computational Social Systems, doi: 10.1109/TCSS.2022.3159109.

# Dr. Nitin Saurabh

## Asst Professor, Theoretical Computer Science, CSL



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### Major Areas of Research/Up to 3 major sponsored projects

Theoretical Computer Science. In particular, Computational Complexity theory, especially Boolean and Algebraic complexity theory, Analysis of Boolean functions and Algorithms.

### Major Research Facilities in the Group

### Technology/Product Developed/Up to 3 most significant Publications

- 1) Approximate Polymorphisms.  
G. Chase, Y. Filmus, D. Minzer, E. Mossel and N. Saurabh. In STOC 2022.
- 1) Improved Bounds on Fourier entropy and min-entropy.  
S. Arunachalam, S. Chakraborty, M. Koucky, N. Saurabh and R. de Wolf.  
In ACM TOCT 13, 2021.
- 1) Some Complete and Intermediate Polynomials in Algebraic Complexity Theory.  
M. Mahajan and N. Saurabh. In Theory of Computing Systems 62, 2018.

# Praveen Tammana

## Asst. Professor, NetX Lab, CSE Department

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### Major Areas of Research/Up to 3 major sponsored projects

Computer Networks and Systems

Network Security

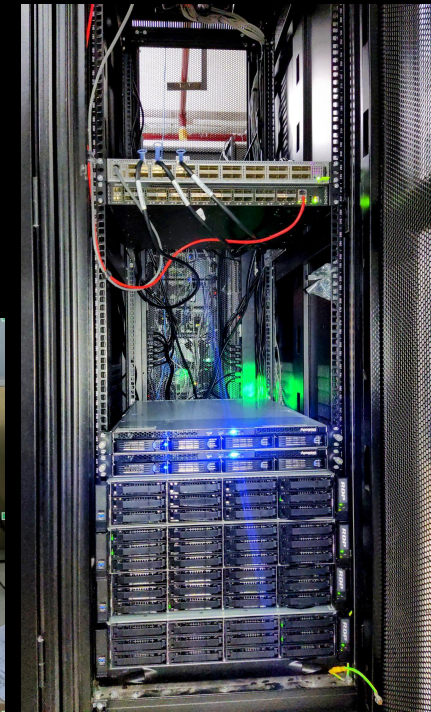
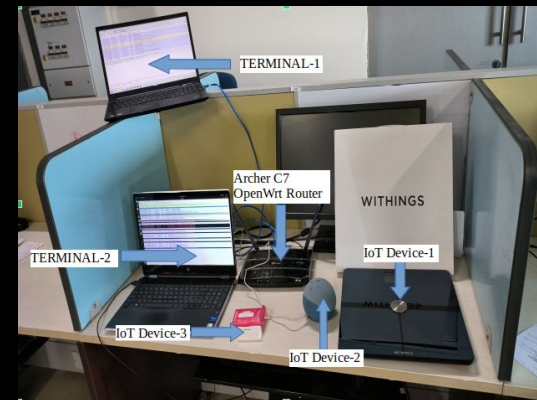
Edge compute, Software-Defined Networks, P4

### Major Research Facilities in the Group

IoT devices connected to P4/SDN/Servers

Kubernetes cluster for observability

Software-Defined Networking testbed



### Technology/Product Developed/Up to 3 most significant Publications

PUF-based Authentication Protocol for IoT Security

IoT-MUD enforcement to secure L3/L4 communication

Efficient Intrusion detection system

Edge Cloud for Autonomous Navigation Applications

Validation of packet-processing behavior at a P4 switch

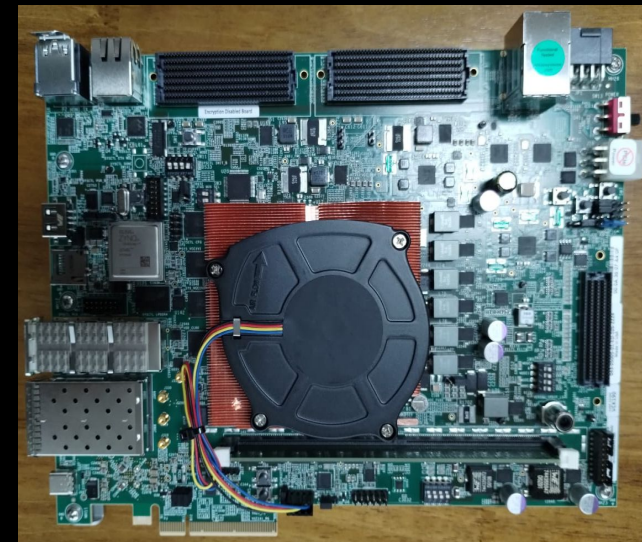


### Major Areas of Research/Up to 3 major sponsored projects

1. Computer architecture
2. Embedded systems
3. VLSI design automation

### Major Research Facilities in the Group

1. ZCU102 board
2. Versal ACAP (VCK190) board



### Technology/Product Developed/Up to 3 most significant Publications

1. CoMeT – Open source architectural and thermal simulator, TACO 2022
2. DSE of FPGA based system with DNN Accelerators, IEEE ESL 2021
3. CoreMemDTM: Thermal management for processor and 3D memory, DATE 2022

# Rakesh Venkat

## Assistant Professor, CSE Department

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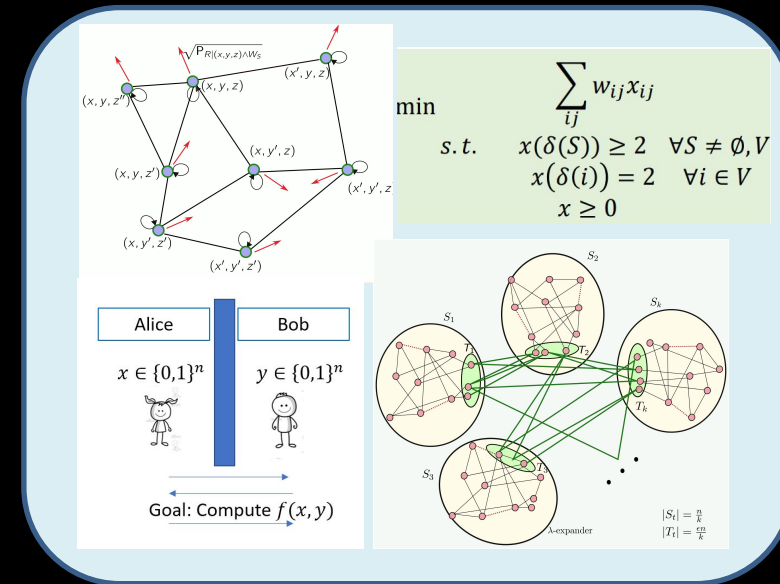


## Major Areas of Research/Up to 3 major sponsored projects

Broad Area: Theoretical Computer Science

Graph Partitioning, Communication Complexity, Approximation Algorithms, Quantum Computation

## Major Research Facilities in the Group



## Technology/Product Developed/Up to 3 most significant Publications

*A Refined Approximation for Euclidean k-Means* (with F. Grandoni, R. Ostrovsky, Y. Rabani, L. Schulman), Information Processing Letters, 2022

*Semi-random Graphs with Planted Sparse Vertex Cuts: Algorithms for Exact and Approximate Recovery.* With A.Louis, ICALP 2019

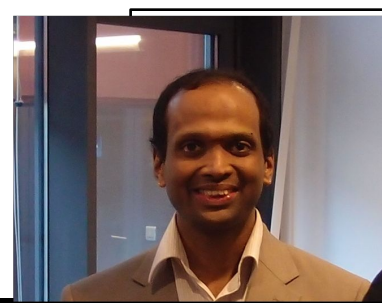
*Multiplayer Parallel Repetition for Expanding Games* (with I. Dinur, P. Harsha, H. Yuen, ITCS 2017)



# Ramakrishna Upadrasta

Associate Professor, Compilers Lab, CSE

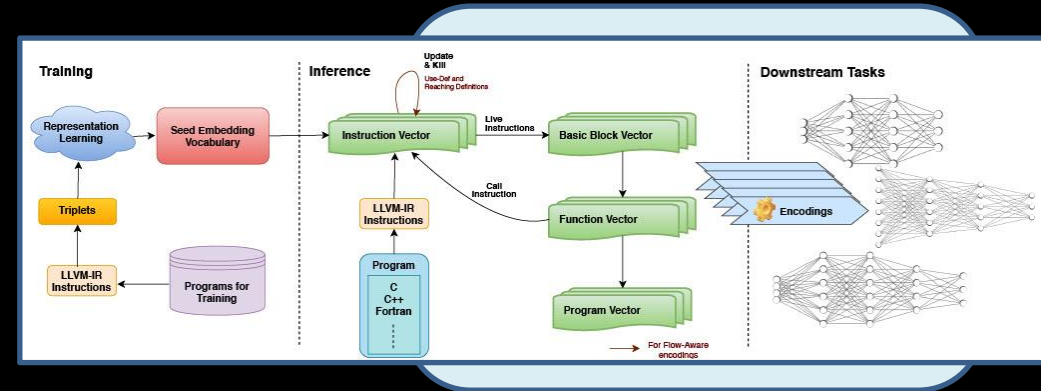
[ramakrishna@cse.iith.ac.in](mailto:ramakrishna@cse.iith.ac.in) <https://people.iith.ac.in/ramakrishna/> <https://compilers.cse.iith.ac.in/>



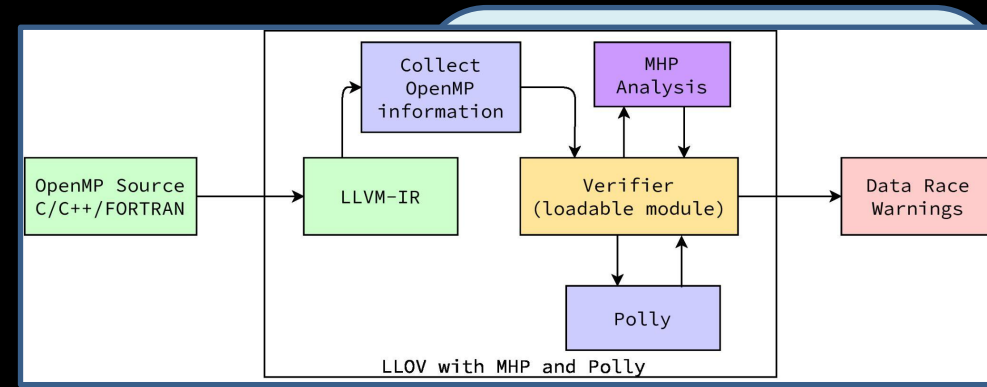
## Major Areas of Research

Compilers, Compiler Optimizations, Polyhedral Compilation, Machine Learning for Compilers, Compilers for Machine Learning, High Performance Computing (HPC), Compilers for Networking

data-planes, Open-source Compiler Infrastructures



## Major Research Facilities in the Group



## Technology/Product Developed

IR2Vec, LLOV, UTVPI-OA, BullsEye, RL4ReAl, GeMS, ...



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# Rameshwar Pratap

Assistant Professor, Computer Science & Engineering



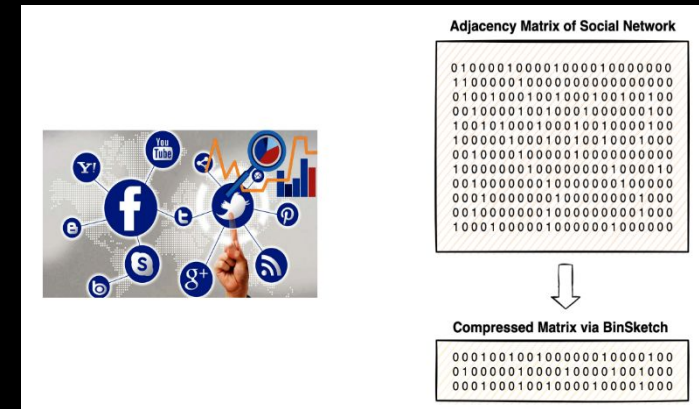
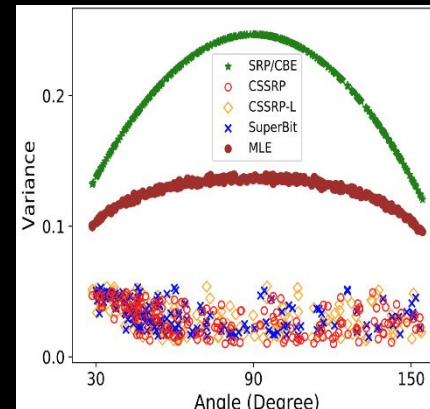
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## Major Areas of Research

- 1) Algorithm for Big Data
- 2) Sketching and Sampling Algorithms
- 3) Machine Learning
- 4) Theoretical Computer Science



## Technology/Product Developed/Up to 3 most significant Publications

- 1) Dimensionality Reduction for Categorical Data. Debajyoti Bera, Rameshwar Pratap, and Bisham Dev Verma. Accepted to the [IEEE Transactions on Knowledge and Data Engineering \(TKDE\)](#), 2021. ([Paper link.](#))
- 2) Variance reduction in Feature Hashing using MLE and Control Variate Method. Bisham Dev Verma, Rameshwar Pratap, and Manoj Thakur. In the [Machine Learning](#), 2022. ([Paper Link.](#))
- 3) Efficient Sketching Algorithm for Sparse Binary Data. Rameshwar Pratap, Debajyoti Bera, and Karthik Revanuru. In [IEEE-ICDM](#) (International Conferences of Data Mining), pages 508-517, 2019.

# Rogers Mathew

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Indian Institute of Technology Hyderabad



## Major Areas of Research

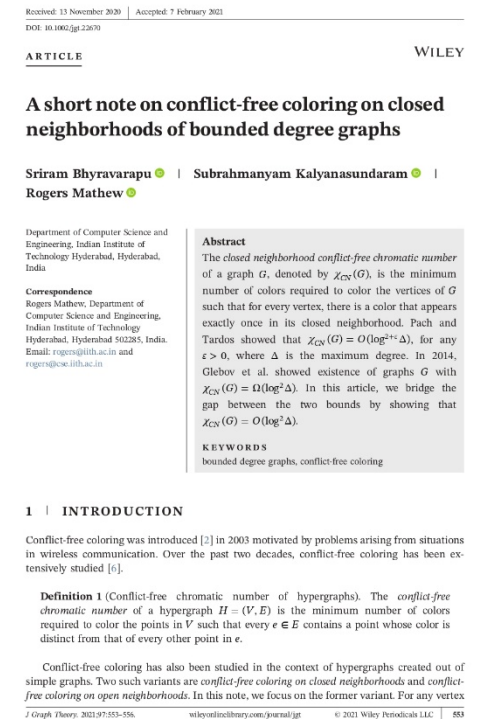
1. Combinatorics
2. Graph Theory
3. Graph Algorithms

## Major Research Facilities in the Group

Nil. The work is fully mathematical in nature that needs only pen and paper.

## Three Most Significant Publications

1. Sriram Bhyravarapu, Subrahmanyam Kalyanasundaram, Rogers Mathew: A short note on conflict-free coloring on closed neighborhoods of bounded degree graphs. *J. Graph Theory* 97(4): 553-556 (2021)
2. Rogers Mathew, Ilan Newman, Yuri Rabinovich, Deepak Rajendraprasad: Hamiltonian and pseudo-Hamiltonian cycles and fillings in simplicial complexes. *J. Comb. Theory, Ser. B* 150: 119-143 (2021)
3. Rogers Mathew, Tapas Kumar Mishra, Ritabrata Ray, Shashank Srivastava: Modular and Fractional  $\$L\$$ -Intersecting Families of Vector Spaces. *Electron. J. Comb.* 29(1) (2022)



# Dr. Sathya Peri

## Associate Professor, PDCR Lab, CSE Dept, IITH

C420; +91 40 2301 6359; [sathya\\_p@cse.iith.ac.in](mailto:sathya_p@cse.iith.ac.in); [www.iith.ac.in/~sathya\\_p](http://www.iith.ac.in/~sathya_p)



భారతీయ సాంకేతిక విజ్ఞాన సంస్థ హైదరాబాద్  
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Indian Institute of Technology Hyderabad



### Major Areas of Research

- Parallel & Concurrent Systems
- Distributed Systems & Blockchains

### Up to 3 major sponsored projects

- Parallelization of Smart Contract Execution in Tezos Blockchain
- Design and Development of a Unified Blockchain Framework for offering National Blockchain Service
- Concurrent and Distributed Programming primitives and algorithms for Temporal Graphs



### Major Areas of Research:

*Most computer architecture innovations during the past 20 years have been based on the incorrect assumption that everything is innocent. A Side Channel or Covert Channel attack on such innovations can leak information and also degrades performance.*

### My research areas are:

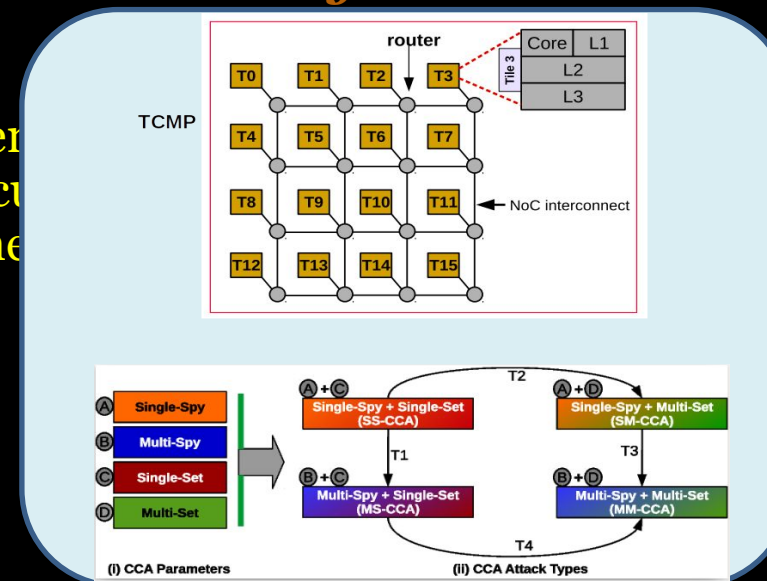
- **Computer Architecture** - Designing efficient cache memories
- **Hardware Security** - Making the multicore systems secure
- **Emerging Memory Technologies** - Using alternate memory technologies to design cache memories.

### Major Research Facilities:

- **Simulators Used:** gem5, Champsim, CACTI.
- **Modules available:** Tiled-based CMP (TCMP) with 2, 3, and 4 levels of cache memories, NVM support for Champsim, MESI CMP Protocol for 2, 3, and 4 levels of cache hierarchy, Covert Channel Attack (CCA) on TCMP.

### Three most significant Publications:

1. Jaspinder Kaur and **Shirshendu Das**, "TPPD: Targeted Pseudo Partitioning based Defence for Cross-Core Covert Channel Attacks", *Elsevier Journal of System Architecture*, Accepted, December 2022.
2. Kaustav Goswami, Dip Sankar Banerjee and **Shirshendu Das**, "Towards Enhanced System Efficiency While Mitigating Row Hammer", *ACM Transactions on Architecture and Code Optimization (TACO)*, 18(4), December 2021.
3. Anurag Agarwal, Jaspinder Kaur and **Shirshendu Das**, "Exploiting Secrets by Leveraging Dynamic Cache Partitioning of Last Level Cache", *Design, Automation and Test in Europe Conference (DATE)* 2021.



Different Covert Channel Attacks (CCA) on TCMP

# Ch. Sobhan Babu

## Associate Professor, CSE



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Office Room No.; Office Phone No.; Mobile (optional); Institute Email; Webpage Link

### Major Areas of Research/Up to 3 major sponsored projects

Big Data Analytics, Financial Fraud Analytics  
and applied Graph Theory

### Major Research Facilities in the Group

### Technology/Product Developed/Up to 3 most significant Publications

Mehta, P., Mathews, J., Kumar, K. S., Suryamukhi, K., Babu, C. S., Rao, S. V. K. V., Shivapujimath, V., & Bisht, D. (2019). Big data analytics for tax administration, In Electronic government and the information systems perspective - 8th international conference, EGOVIS 2019, linz, austria, august 26-29, 2019, proceedings. □

Adsul, B., Babu, C. S., Garg, J., Mehta, R., & Sohoni, M. A. (2010b). A simplex-like algorithm for fisher markets, In Algorithmic game theory - third international symposium, SAGT 2010, athens, greece, october 18-20, 2010. proceedings.

# Srijith P K

## Associate Professor, BRAIN, Computer Science and Engineering

Office 535 Block C ; Phone No. 080 2301 6186; [srijith@cse.iith.ac.in](mailto:srijith@cse.iith.ac.in);

<https://sites.google.com/site/pksrijith/home> ; <https://sites.google.com/view/brainiith>



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### Major Areas of Research/Up to 3 major sponsored projects

Machine learning, Deep Learning, Bayesian learning, Continual Learning.

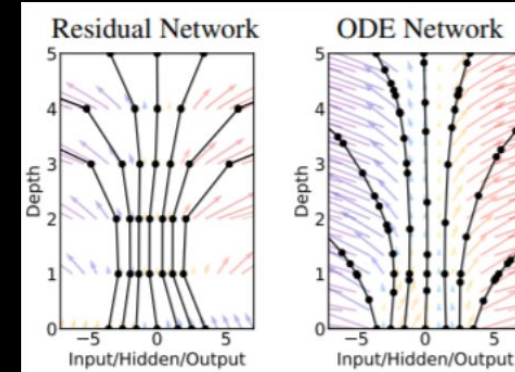
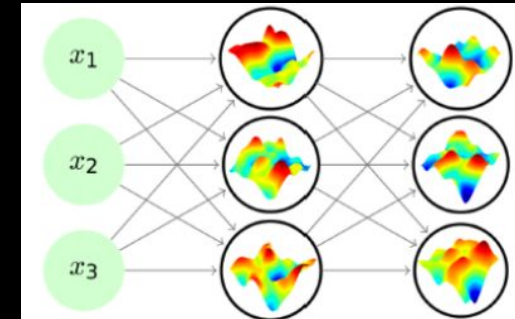
Applications : Computer Vision, natural language processing and social media.

Publications in top venues like NeurIPS, AAI, WACV, ACL, EMNLP, UAI etc.

### Major Research Facilities in the Group

Expertise in machine learning , deep learning, vision, language, social media, generative modelling and spatio- temporal modelling.

GPU servers and access to the state-of-the-art NVIDIA DGX servers.



### Technology/Product Developed/Up to 3 most significant Publications

1. Srikar Dupati, Sakshi Varshney, P.K. Srijith, Sunil, Gupta, Continual Learning with Dependency Preserving Hypernetworks, IEEE/CVF Winter Conference on Applications of Computer Vision (WACV) 2023.
2. Srinivas Anumasa and P. K. Srijith, Latent Time Neural Ordinary Differential Equations, Proceedings of the Association for the Advancement of Artificial Intelligence (AAAI), 2022.
3. Sakshi Varshney, Vinay Kumar Verma, P. K. Srijith, Lawrence Carin, Piyush Rai: CAM-GAN: Continual Adaptation Modules for Generative Adversarial Networks, Neural Information Processing Systems, 2021.
4. Developed a real time social media system to aid people in disaster like floods and earthquakes.

# Subrahmanyam Kalyanasundaram

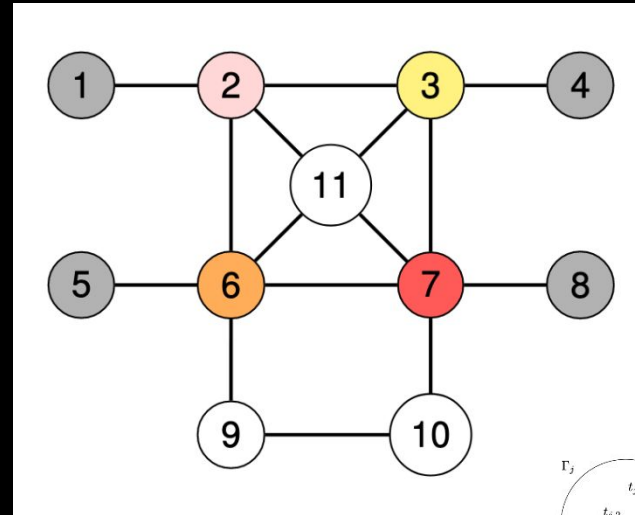
Associate Professor, Theory Group, CSE



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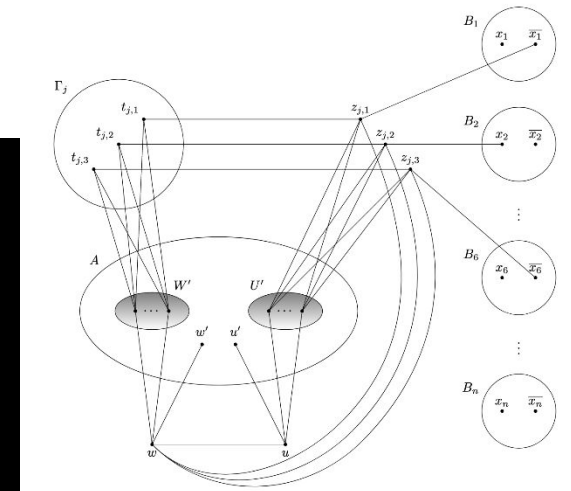
## Major Areas of Research

- Theoretical Computer Science
- Combinatorics
- Graph Algorithms



## Major Research Facilities in the Group

Theoretical research without much need for major facilities



## Selected Publications

- Sriram Bhyravarapu, Subrahmanyam Kalyanasundaram, Rogers Mathew (2022). Conflict-Free Coloring Bounds on Open Neighborhoods. *Algorithmica*, Volume 84, pages 2154-2185.
- Prasad Krishnan, Rogers Mathew, Subrahmanyam Kalyanasundaram (2021). Pliable Index Coding via Conflict-Free Colorings of Hypergraphs. *Proc. of the 2021 IEEE International Symposium on Information Theory - ISIT 2021, Melbourne, Australia.*



# Vineeth N Balasubramanian



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Indian Institute of Technology Hyderabad



Associate Professor, Machine Learning and Vision Lab,  
Department of Computer Science/Artificial Intelligence

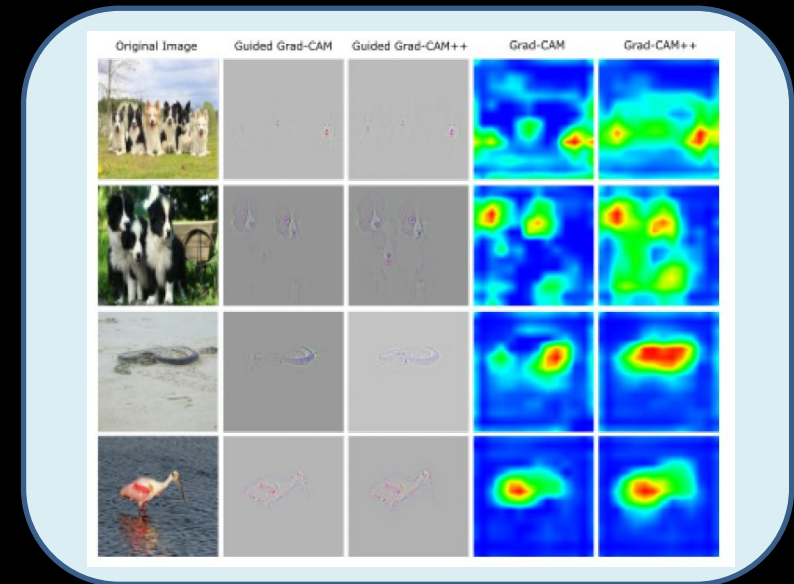
B-314; +91-40-2301 6357; [vineethnb@cse.iith.ac.in](mailto:vineethnb@cse.iith.ac.in); <https://people.iith.ac.in/vineethnb/>

## Major Areas of Research:

- Machine Learning/Deep Learning
- Computer Vision
- Explainable AI
- Causal Inference

## Major Research Facilities in the Group:

- NVIDIA DGX1/DGX2s
- Multiple GPU servers with 1080Ti/2080Tis
- GPU workstations



## Technology/Product Developed/Up to 3 most significant Publications

- **Explainable AI:** Grad-CAM++, WACV 2018 (1300+ citations), NASSCOM AI Gamechanger Runner-up 2022
- **Learning with Limited Labeled Data:** Open-world Object Detection, CVPR 2021 (~150 citations, ~900 stars, ~140 forks), NASSCOM AI Gamechanger Winner 2022
- **Causality:** Causal Perspective to Neural Network Attributions, ICML 2019 (~100 citations, ~50 stars, ~20 forks)