

# Bricks with Clay\*

The Quarterly Newsletter of MFSDSAI @ IITPKd

This is the third issue of the quarterly newsletter of the Mehta Family School of Data Science & Artificial Intelligence at IIT Palakkad. The newsletter features important events in the school and the achievements of the members in the quarter. This edition also features conversations with a faculty member and an interview with one of the Deputy Contingent Leads of the IIT Palakkad team that won laurels at Inter-IIT Tech Meet 14.0.

## ~ Events ~

### 1. Talk by Prof. Deepak Padmanabhan, Queen's University Belfast, UK

Aug 2025



The Department Colloquium by Prof. Deepak Padmanabhan from the Department of Computer Science, Queen's University Belfast, UK on **AI and Capitalism: What is Going On?** explored the connection between the technology of AI and the ethos of capitalism. The talk was well-attended. Prof. Padmanabhan also interacted with the students of the school prior to the talk.

### 2. Invited talk by Dr. Kamanchi Chandramouli, IBM

Sep 2025



Dr. Kamanchi Chandramouli from IBM delivered a talk at the Industry Academia Conclave 7.0 on **An Application of the Newsboy Problem in Supply Chain Optimization of Online Fashion E-Commerce** in the Artificial Intelligence (AI), Machine Learning, and Cyber Security track.

### 3. Invited talk by Mr. Manoj Apte, TCS

Sep 2025



Mr. Manoj Apte from TCS delivered a talk at the Industry Academia Conclave 7.0 on **Applications of machine learning in detection of Money Laundering** in the Artificial Intelligence (AI), Machine Learning, and Cyber Security track.

## ~ Welcome! ~



The school extends a warm welcome to the newly joined faculty, **Dr. V. Raghava Mutharaju**. His research interests include Knowledge Graphs, Ontology modeling, Explainable AI, and Neurosymbolic AI.

## ~ Outreach ~

### 1. **Workshop on Codes, Sequences, and Information Theory at IISc, Bangalore**

Oct 2025

Dr. Nikhil Krishnan M. co-organized the workshop **CodeIT: CNI Workshop on Codes, Sequences and Information Theory**, held at the Indian Institute of Science, Bengaluru, during October 11-12, 2025. He also delivered a talk titled “Two Way Generalization of a Binary Burst Correcting Code”.

### 2. **ACM IndiCS Winter School and Seminar on Algorithmic Mechanism Design**

Dec 2025

Dr. Garima Shakya was invited to attend the ACM India IndiCS Winter School and Seminar on Algorithmic Mechanism Design, hosted at the Amrita Vishwa Vidyapeetham, Coimbatore campus, Dec 08-11.

## ~ Publications ~

- “Map Wisely for Efficient Transfer Learning Across Heterogeneous Data Sources”, Snigdhatanu Acharya and Mrinal Das, **Elsevier Neurocomputing**, 2025.
- “TChat: A Conversational Agent with Temporal Commonsense”, Pranav Guruprasad Rao, Rachit Jain Sandeep, Koninika Pal, **ProActLLM @ Conference on Information and Knowledge Management (CIKM)**, 2025
- “Extracting Numerical Assertion from Text”, Amar Parajuli, Koninika Pal, **AACL**, 2025.
- “Objectifying the Subjective: Cognitive Biases in Topic Interpretations”, Swapnil Hingmire, Ze Shi Li, Shiyu (Vivienne) Zeng, Ahmed Musa Awon, Luiz Franciscatto Guerra, Neil Ernst, **Transactions of the Association for Computational Linguistics**, 2025.
- “Tractable Sharpness-aware Learning of Probabilistic Circuits”, H Suresh, S Sidheekh, M P Vishnu Shreeram, S Natarajan, and N C Krishnan, *accepted to AAAI Conference on Artificial Intelligence*, 2026.

## ~ Achievements ~

- The research grant awarded to Dr. Mrinal Das, for the project titled “Crack Detection using Automated Magnetic Particle Inspection through Artificial Intelligence” by Sansera Engineering Ltd. was extended by a year.
- Dr. Koninika Pal and Dr. Swapnil Hingmire received the **Anusandhan National Research Foundation (ANRF) Advance Research Grant (ARG)** for the proposal titled “Developing Indic Language Models to Enrich Resources for Education”.
- Dr. Nikhil Krishnan received the **ANRF ARG Mathematical Research Impact Centric Support (MATRICS)** for the proposal titled “Convertible Codes: Enabling Access and Bandwidth Efficient Code Conversions in Large-Scale Storage Systems”.

Congratulations, Mrinal, Koninika, Swapnil, and Nikhil!



Our students participated and won multiple accolades at Inter-IIT Tech Meet 14.0

- The team comprising Madhav Shivaji Deshatwad, Budde Shrikant Tryambak, G L John Salvin, Anup Kumar, Parvathy Rajesh, and Mekarthi Vivek Chaithanya secured the **bronze medal** in NLP (Observer.AI) (Mid Prep).
- Patel Parv Hetalkumar and Hemant Pathak won the **4<sup>th</sup> position among all IITs** in Algorithmic Optimization (on-the-spot problem statement).
- Mayank Tewatia and team bagged the **6<sup>th</sup> position** in the Engineer's Conclave.
- The team comprising students from multiple departments including Data Science secured the **10<sup>th</sup> rank** in Agentic AI (Pathway) (High Prep).

*... more details in the sequel.*

Congratulations to all the winners and participants!

## ~ Tech-a-BOW ~

In conversation with **Prisha Italiya**, one of the Deputy Contingent Leads of the IIT Palakkad team that won laurels at Inter-IIT Tech Meet 14.0.



Q. *Congratulations! Tell us about Inter-IIT Tech Meet 14.0.*

A. With the institute securing the 16th overall rank, Inter-IIT Tech Meet 14.0, hosted by Indian Institute of Technology Patna from December 11 to December 14, was conducted as the annual technical meet of all IITs. The event witnessed participation from 23 IITs, with approximately 1,600 participants, including undergraduate, post-graduate, and PhD students from across the country.

Events were classified as:

- High Prep: long-term, research-heavy projects
- Mid Prep: few weeks to design and build solutions
- Low Prep: short prep, idea and approach focused
- No Prep: on-the-spot problem solving

The Research & Innovation track included Students' Academic Conclave (SAC) for presenting published research papers and Engineers' Conclave (EC) for presenting student-built projects.

Q. *In which events did DS students participate? What did we win?*

A. DS students participated in several events at Inter-IIT Tech Meet 14.0 and delivered strong performances across industry-sponsored challenges, research, and innovation tracks. It is

*important to note that these teams also included students from other departments, and the results reflect collaborative inter-departmental efforts.*

in NLP (Observe.AI) and consistent performances across diverse technical domains, highlighting strong cross-department collaboration.

Q. *What were the challenges different teams faced, and how did they prepare for the event?*

A. Most teams found the problem statement very broad and complex, especially the evaluation part. Many of us had to work with new tools and frameworks, particularly streaming-based systems like Pathway, which was very different from normal batch processing. Building a system that works in real time, handles live data correctly, and still remains stable and explainable was challenging. Another major issue was limited resources, such as lack of proper GPU access, servers, or hosting facilities. Teams prepared by carefully studying the problem statement and documentation, finalizing their system design early, optimizing their models, and depending a lot on teamwork and mentor guidance.

Q. *How do the next batch of students take part in it? How much and what sort of preparation is needed?*

A. The most important thing is interest and curiosity. You do not need to be an expert before joining. Many students learn most of the required skills during the competition itself. Choosing a problem statement that matches your interests helps a lot. Preparation mainly involves understanding basic concepts related to the problem, exploring previous problem statements, and doing some hands-on practice. Teamwork, learning from seniors

Overall, DS students contributed significantly to multiple teams, with a notable Rank 3 finish

and mentors, and being open to learning new things quickly are more important than already knowing everything.

**Q. What areas should we focus on and improve?**

A. Technically, future teams should focus more on real-time systems, streaming data, and building efficient and low-latency pipelines. A clearer understanding of agent-based systems and how different components interact is also important. If large language models are used, care should be taken to ensure reliable and controlled outputs. Apart from technical skills, time management, documentation, deployment, and presentation quality need improvement. Many teams lost points due to missing reports, unhosted demos, or rushed submissions. Good visuals, clear explanations, and polished presentations make a big

difference.

**Q. How was the travel, stay, etc.? Did you get to explore the city?**

A. The travel experience was mixed, especially because of long train journeys, which were tiring for some. However, these long hours also helped with team bonding. Stay and food had both good and bad moments, but overall the arrangements were managed well. Teams explored parts of IIT Patna campus and the city. Visiting places like the Bihar Museum and trying local food were memorable. One of the most exciting parts was the networking dinner, where we got to interact with students from other IITs, exchange ideas, and learn about their approaches and experiences. That interaction made the event even more valuable.

**Q. Is the team energized after this successful bout and excited to get**

*back to courses, placements, etc.?*

A. Yes, the experience was highly motivating. Although the competition was exhausting, it boosted confidence and gave students a clearer idea of their strengths and areas to improve. Working on real-world problems under pressure helped improve technical skills, teamwork, and problem-solving abilities. The experience also had direct career benefits. Some students, especially from the NLP domain, received internship opportunities based on their work during the competition. Overall, it strengthened resumes, provided strong talking points for internships and placements, and encouraged students to take up more challenging projects in the future.

*Congratulations once again to you and all the participants and winners! We are proud of you.*

## ~ Research Corner ~

In conversation with **Dr. Garima Shakya** who joined the school faculty recently.



**Q. Tell us about your research.**

A. My research interests include game theory and mechanism design, collective welfare, fair division, multi-agent resource allocation, algorithms, and computational social choice. More recently, I have also developed a special interest in using data sci-

ence to derive social insights.

**Q. I can imagine it surfacing in many real-life circumstances. Can you give some examples?**

A. Game theory and Mechanism design for resource allocation are widely used whenever rational and intelligent entities are involved, for example, slot allocation at airports, organ exchange, gig platforms, peer grading, and online shopping platforms.

**Q. That is quite interesting but these subjects do not seem to be part of the undergraduate curriculum. Are the details too hard to understand?**

A. The details are not intricate, and to begin with, it requires some

knowledge of courses in computer science and mathematics, such as discrete mathematics, algorithms, and optimization.

**Q. How do these ideas interplay with data science in general and AI in particular?**

A. Many problems in mechanism design start with unknown information, such as the value distributions of bidders in auctions, the likelihood of successful matches in organ exchanges, or the costs and demand faced by customers and service providers on a gig platform. Data science can provide statistical tools and predictive models to estimate these unknown factors.

On the other side, many AI

and machine learning projects involve multiple parties, each with potentially different goals and private information. In these cases, incorporating incentives and fairness is crucial, as it ensures the system functions properly and ethically, for example, in federated learning and multi-agent reinforcement learning.

Q. *Are we implementing some of these ideas in guide allocation, project allocation etc. in our school?*

A. Yes, we are already using some versions of the existing mechanisms, for example, admissions of students to the institute, and hostel room allocation. We can also use it in other scenarios, such as OELP allocation, where students work in teams. Last semester, two students worked with me on it as their OELP project. We plan to propose it to the institute for implementation.

Q. *A bit about your academic background*

A. Before joining IIT Palakkad, I was a postdoc at Kyushu University in Japan, followed by a postdoc at

the Chennai Mathematical Institute in India. I got my PhD in CSE from IIT Kanpur. I earned my M. Tech. and B.Tech. in CSE from the Indian Institute of Engineering Science and Technology Shibpur in West Bengal and NDUAT Faizabad in Uttar Pradesh, respectively. I was honoured to receive gold medals for securing the highest scores in both degrees.

Q. *What do you love better, teaching or research?*

A. Well, I love both :) And that's what makes academia a perfect fit for me.

Q. *Apart from academics, what do you enjoy?*

A. I enjoy hiking, exploring maps, and watching acclaimed films in various languages, and I cherish spending quality time with my son.

Q. *Do you have any new ideas for the school or our students?*

A. The department has already built strong momentum through invited talks, curriculum updates, and regular meetings throughout

the year. The next step is to help students engage with AI research across a broader range of areas. As a young and growing department, we can build this exposure quickly by running a series of small, theme-based events—such as a half-day tutorial or workshop focused on one topic at a time.

My message to the students is to meet often to exchange ideas, attend expert talks by the department and the Institute, and continue to expand your sense of the contributions you can make. Specifically for research scholars and second-year MTech students, here is a quote by Richard W. Hamming—one that my PhD advisor often emphasizes, and one that has helped me throughout my own research journey: “If you believe too much, you’ll miss the flaws; if you doubt too much, you won’t begin. It takes a fine balance.”

*Dr. Garima would be happy to discuss and exchange ideas. One can find her in her office on the second floor of Dr. APJ Abdul Kalam block.*

## ~ Editor's dime for the Quarter ~

My starting point is to recall to you that each of the quantitative physical sciences—such as physics, chemistry, and most branches of engineering—is comprised of an amalgam of two **distinctly different** components. That these two facets of each science are indeed distinct from one another, that they are made of totally different stuff, is rarely mentioned and certainly not emphasized in the traditional college training of the engineer or scientist. Separate concepts from the two components are continually confused. In fact, we even lack a convenient language for keeping them straight in our thinking. I shall call the two parts Facet A and Facet B.

Facet A consists of observations on, and manipulations of, the “real world”. Do not ask me what this real world is: my thoughts become hopelessly muddled here. Let us assume that we all understand the term and agree on what it means. For the electrical engineer, this real world contains oscilloscopes and wires and voltmeters and coils and transistors and thousands of other tangible devices. These are fabricated, interconnected, energized, and studied with other real instruments. Numbers describing the state of this real world are derived from reading meters, thermometers, counters, and dial settings. They are recorded in notebooks as **rational real numbers**. (No other kind of number seems to be **directly** obtained in this real world.)

Facet B is something else again. It is a mathematical model and the means for operating with the model. It consists of papers and pencils and symbols and rules for manipulating the symbols. It also consists of the minds of the men and women who invent and interpret the rules and manipulate the symbols, for without the seeming consistency of their thinking processes there would be no single model to consider. When numerical values are given to some of the symbols, the rules prescribe numerical values for other symbols of the model.

Now, as you all know, *we like to think that there is an intimate relationship between Facet A and Facet B* of a given science. The numerical value associated with the symbol  $V_3$  in the model should, in the right circumstances, agree with the reading of the voltmeter we have labeled #3 on the workbench over there, the meter we touch in Facet A. Indeed, so confident are we of this agreement that we use the very same name “the voltage across  $R_3$ ” for these two very different quantities, thus confounding hopelessly the distinction between these constructs. I have carefully said that we “like to think” that there is an intimate relationship between the facets because, in fact, under closer scrutiny one sees the correspondence as tenuous, most incomplete, and imprecise. There is a myriad of detail in the laboratory ignored in the model. Worse yet, many key parts of the model—many of its concepts and operations—have no counterpart in Facet A. **To the extent that there is some correspondence between Facets A and B, we have the miracle of modern science**—the deepening understanding of our universe, and the bounty and ease of the technological society in which we live. **A second-order miracle, little recognized or appreciated, is that this first miracle could arise from such a really ragged fit between the facets.**

— David Slepian, **On Bandwidth**, Proceedings of the IEEE, Vol. 64, No. 3, Mar 1976.

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