



CONFai

Conference on

# ARTIFICIAL INTELLIGENCE

2<sup>nd</sup> Annual Academic Conference

March 22 - 24, 2023  
Mohali, India

Technical Sponsor:



# ABOUT CONFai

Data-driven approaches have become a paradigm of choice for experimental modeling, understanding and discovery. Prompted in part by significant advances in algorithmics sensing capabilities, and algorithms (such as statistical modelling, deep neural networks, machine learning) and in part by as well by increased computational capabilities and digitization, AI has proliferated almost all aspects of human endeavors and continues to proliferate in diverse application areas.

This three-day academic conference aims to highlight the potential of AI and Data Science in finding effective solutions to societal challenges. Presentations at ConfAI will look at fundamental contributions in the areas of AI and Data Science. We will focus on theory of AI (algorithms, representation learning, data modelling, inference methods, privacy), AI applications (natural language processing, computer vision, robotics), AI for social good (digital agriculture, digital healthcare, AI for water security), and techno-philosophy (Ethics of AI) among others.



For more information  
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To connect with the Chair, please send an email to  
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For any queries related to the conference,  
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## FLASH TALK BY AI GEN NEXT

Presentation of contributed papers, posters & demos

ConfAI 2023 will include peer-reviewed contributed papers, poster and demos of early ideas, late-breaking results, and open research questions.

Apart from novel contributions, ConfAI 2023 offers PhD scholars and researchers an opportunity to present papers which have been presented at a top-tier conference venue or accepted in a top-tier journal in the year 2022.

Presentations at ConfAI 2023 will also look at fundamental contributions in AI and Data Science. We extend a call for papers in the theory of AI (such as algorithms, representation learning, data models, various inference methods, privacy, and related domains), AI applications (such as natural language processing, computer vision, robotics, agriculture, healthcare, AI for social good), and techno-philosophy (Ethics of AI) among others.

For more details, refer to [www.conf-ai.com/call-for-papers](http://www.conf-ai.com/call-for-papers)



# SNIPPETS OF CONFai 2022



DAY  
1

WEDNESDAY, 22 MARCH

09:00 - 09:30

## WELCOME BEVERAGE

09:30 - 09:45

Welcome by General Co-chairs

09:45 - 10:30

Keynote by Dr. Rajeev Rastogi, Amazon  
Modeling best practices based on e-commerce applications at Amazon

10:30 - 11:00

Invited Talk by Dr. Sumohana Channappayya, IIT Hyderabad  
Completely blind quality assessment of user-generated video content

11:00 - 11:30

## BREAK

11:30 - 12:15

Keynote by Dr. Vivek Raghavan, IndiaStack  
Indian Language AI as Digital Public Good (DPG)

12:15 - 13:00

Contributed paper presentations

13:00 - 14:00

## LUNCH

14:00 - 14:45

Keynote by Dr. Rohini Srivathsa, Microsoft  
Demystifying Generative AI

14:45 - 15:45

Panel Discussion on "Diversity & Inclusion in AI"  
Panelist - Ankit Bose, NASSCOM

Nishtha Dewani, IBM

Dr. Rohini Srivathsa, Microsoft

Dr. Sudhir Voleti, ISB Institute of Data Science

Moderator - Dr. Nandini Kannan, Plaksha University

15:45 - 16:00

## BREAK

16:00 - 18:30

Networking over Plaksha Social

DAY  
2

THURSDAY, 23 MARCH

09:00 - 09:30

### WELCOME BEVERAGE

09:30 - 10:15

Keynote by Dr. Vasudeva Varma, IIIT  
Hyderabad

Generating encyclopaedic content in Indian  
languages

10:15 - 10:45

Invited Talk by Dr. Siddharth Barman, IISc  
Collective Welfare as a Metric in Algorithmic  
Decision Making

10:45 - 11:00

### BREAK

11:00 - 11:45

Keynote by Dr. Rohini K. Srihari,  
The State University of New York, Buffalo  
Conversational AI - Research Challenges and  
Opportunities for Societal Impact

11:45 - 12:15

Invited Talk by Dr. Abhinav Dhall, IIT Ropar  
Emotion Aware AI

12:15 - 13:00

Contributed paper presentations

13:00 - 14:00

### LUNCH

14:00 - 14:30

Invited Talk by Dr. Parag Singla, IIT Delhi  
Exploiting Underlying Problem Structure for  
Improved Generalizability and Interpretability in  
Neural Models.

14:30 - 15:30

Contributed paper presentations

15:30 - 16:00

### BREAK

16:00 - 16:30

Invited Talk by Dr. Shivkumar Kalyanaraman,  
Microsoft

The Software- and AI-Driven Future of Renewables

16:30 - 17:30

Panel Discussion on 'AI /ML for clean energy

Panelist - Prof. Rajesh Gupta, UC San Diego

Dr. Amarjeet Singh, Zenatix Solutions

Prasad Vaidya, Solar Decathlon India

Dr. Shalini Sarin, Elektromobilitat India

Moderator - Prof. Vishal Garg, Plaksha University

19:30 - 22:00

ConfAI Gala Dinner at Novotel Chandigarh



DAY  
3

FRIDAY, 24 MARCH

09:00 - 09:30

**WELCOME BEVERAGE**

09:30 - 10:15

Keynote by Dr. Partha Talukdar,  
Google Research

Inclusive Language Technologies for All

10:15 - 10:45

Invited Talk by Dr. Saket Anand, IIIT Delhi  
Visual Wildlife Monitoring in India

10:45 - 11:15

Invited Talk by Dr. Rohan Paul, IIT Delhi  
Towards human-like reasoning for  
embodied ai agents

11:15 - 11:30

**BREAK**

11:30 - 12:30

AI in practice: Entrepreneurial Presentation

12:30 - 13:00

Awards ceremony and closing remarks

13:00 - 14:00

**LUNCH**

— **END OF CONFERENCE** —

## KEYNOTE SPEAKERS



### **Dr. Vasudeva Varma**

Head, Language Technologies Research Centre  
Head, Information Retrieval and Extraction Lab  
Professor, IIIT Hyderabad

**Title:** Generating encyclopaedic content in Indian languages: Challenges and Opportunities

**Abstract:** Wikipedia is one of the most important sources for learning and knowledge acquisition, known as “Sum of All Human Knowledge”. Every human should have access to this knowledge, irrespective of their language. Unfortunately, availability of Wikipedia content in regional languages - especially Indian languages - is very low. Most major Indian languages only have about 1-2% coverage compared to English Wikipedia content.

To address this challenge we developed a multi-pronged approach that leverages various methods such as Data2Text, Fact2Text, Knowledge2Text and state-of-the art language generation technologies to create factual encyclopaedic content with high quality assurance through human in the loop processes.

In this talk I will discuss our experiences while developing these solutions and share details on some research challenges faced during development process along with few potential solutions that could be used by others.



**Dr. Rohini K. Srihari**  
**Professor and Associate Chair**

Department of Computer Science and Engineering  
University at Buffalo,

**The State University of New York**



**Title:** Conversational AI - Research Challenges and Opportunities for Societal Impact

**Abstract:** There has been much discussion and anxiety over the recent release of ChatGPT, a tool that uses foundational models for generating text in response to complex prompts. Educators in particular are alarmed over its use by students that represent academic dishonesty; many are referring to these as cheatbots. Ironically, despite the word "chat", they are not really very good when it comes to participating in extended and engaging conversation with humans. This talk begins with a discussion of the capabilities and limitations of synthetic text generation models. The focus is on research advances that are necessary in order to use chatbots for "purposeful" conversations. This includes assisting those with physical limitations and mental anxiety as well as the more ambitious goal of persuading people to alter their behaviour or beliefs. Enabling such applications requires fundamental advances in natural language understanding and generation, including computational models for persuasion, avoidance of hallucinations, and the generation of empathetic, socially responsible utterances. Recent progress related to combating disinformation and hate speech in social media will be discussed. If the research challenges can be addressed, chatbots, or socialbots represent a scalable solution to many societal problems.



**Dr. Partha Talukdar**

Staff Research Scientist, Google Research,  
Bangalore

Associate Professor, Department of Computational  
& Data Science, IISc Bangalore



**Title:** Inclusive Language Technologies for All

**Abstract:** Even though there are more than 7000 languages in the world, language technologies are available only for a handful of these languages. Lack of training data poses a significant challenge in developing language technologies for these languages. Recent advances in Multilingual Large Language Modeling presents an opportunity to transfer knowledge and supervision from high web-resource languages to languages with lower web-resources. In this talk, I shall present an overview of research in this promising and emerging area in the NLU group at Google Research India.



**Dr. Rohini Srivathsa**

National Technology Officer  
Microsoft India



**Dr. Rajeev Rastogi**

Vice President, Machine Learning  
Amazon

**Title:** Modeling Best Practices based on e-commerce applications at Amazon



## INVITED SPEAKERS



### **Dr. Siddharth Barman**

**Associate Professor and Ramanujan Fellow**

Department of Computer Science and Automation  
IISc Bangalore

**Title:** Collective Welfare as a Metric in Algorithmic Decision Making

**Abstract:** Regret minimization is a pre-eminent objective in the study of decision making under uncertainty. Indeed, regret is a central notion in multi-armed bandits, reinforcement learning, game theory, decision theory, and causal inference. In this talk, I will present our recent work that extends the formulation of regret with a welfarist perspective.



### **Dr. Abhinav Dhall**

**Head, Centre for Applied Research in Data Sciences, IIT Ropar**

**Title:** Emotion Aware AI

**Abstract:** Prof. Marvin Minsky, AI pioneer said "The question is not whether intelligent machines can have any emotions, but whether machines can be intelligent without any emotions". To this end the field of affective computing has witnessed progress in automatic user affect sensing and affect synthesis for an empathetic Human Machine Interaction. In my talk I will discuss different aspects of affect sensing and synthesis and share examples from my and other research labs.



## Dr. Sumohana S. Channappayya

Professor, Department of Electrical Engineering  
IIT Hyderabad



**Title:** Completely Blind Quality Assessment of User-Generated Video Content

**Abstract:** This talk presents our work on addressing the challenging problem of completely blind video quality assessment (BVQA) of user-generated content (UGC). The challenge is twofold since the quality prediction model is oblivious to human opinion scores, and there are no well-defined distortion models for UGC content. Our solution is inspired by a recent computational neuroscience model which hypothesizes that the human visual system (HVS) transforms a natural video input to follow a straighter temporal trajectory in the perceptual domain. A bandpass filter-based computational model of the lateral geniculate nucleus (LGN) and V1 regions of the HVS was used to validate the perceptual straightening hypothesis. We hypothesize that distortions in natural videos lead to a loss in straightness (or increased curvature) in their transformed representations in the HVS. We provide extensive empirical evidence to validate our hypothesis. We quantify the loss in straightness as a measure of temporal quality and show that this measure delivers acceptable quality prediction performance on its own. Further, the temporal quality measure is combined with a state-of-the-art blind spatial (image) quality metric to design a blind video quality predictor that we call Straightness Evaluation Metric (STEM). STEM is shown to deliver state-of-the-art performance over the class of BVQA algorithms on five UGC VQA datasets including KoNViD-1K, LIVE-Qualcomm, LIVE-VQC, CVD and YouTube-UGC. Importantly, our solution is completely blind i.e., training-free generalizes very well, is explainable, has few tunable parameters, and is simple and easy to implement.



**Dr. Rohan Paul**

Assistant Professor & Pankaj Gupta Faculty Fellow, Department of Computer Science and Engineering, IIT Delhi



**Title:** Towards Human-like Reasoning for Embodied AI Agents

**Abstract:** We are entering into an era where AI-based computing will pervade machines that we operate and interact with. This will usher in a future where humans will be working with intelligent embodied agents or robots in a variety of domains such as manufacturing, security, homes etc. In order to work alongside humans, robots must possess "human-like" abilities to understand, reason and act intelligently in the world. This talk discuss learning based models of intelligence that enable embodied agents to understand high-level tasks, reason and synthesise plans and resolve potential ambiguity with active exploration. The talk will present recent results, experiments and research challenges.



## Dr. Parag Singla

Associate Professor, Department of Computer Science & Engineering, IIT Delhi



**Title:** Exploiting Underlying Problem Structure for Improved Generalizability and Interpretability in Neural Models.

**Abstract:** Last decade has seen phenomenal growth in application of neural models to a variety of problems, including those in Computer Vision, NLP and Speech, among other domains. One of the recent research directions has been around the problem of incorporating symbolic reasoning in neural networks, to enable them to be more effective at generalization as well as help them be explainable/interpretable. In this talk, we will present two different problems (and corresponding solutions) in this regard which exploit the underlying problem structure while building neural models. The first one deals with scalable training of neural ILP architectures. Our method is solver-free during training, i.e., it can completely get rid of expensive ILP solver calls during the learning of the model. The key idea is to formulate the problem as learning an ensemble of hyperplanes (seen as the ILP polytope), where the positive point is separated from system generated negatives, using the notion of a margin. Second, we present the problem of explainability in Common-sense Question Answering (CQA). We propose a new dataset (called ECQA), which expresses explanations as a set of positive (negative) properties of the (in)correct answers. We present a neural property ranker/selection module for property retrieval, as well as a GPT-2 based architecture for property generation, given the question and (in)correct answer choice. We conclude with broader research frontiers in the space of neuro-symbolic reasoning.





## **Dr. Shivkumar Kalyanaraman**

CTO, Energy & Mobility, Microsoft R&D India

**Title:** The Software- and AI-Driven Future of Renewables



**Abstract:** Deep decarbonization and the rapid electrification of energy will require greater penetration of renewables. As renewables penetration crosses 10-20% of the grid electricity demand (and other supply sources correspondingly adjust), the intermittency and volatility of renewable supply will increasingly dominate. Renewable supply and grid electricity demand matched via a combination of multiple markets, energy storage and an orchestrated portfolio of diverse flexibility resources. The future of renewables will fundamentally be driven by software and AI on the cloud to manage this transition. Accelerating this transition involves capturing AI patterns (eg: 24/7 matching, Forecasting, Decisions under Uncertainty) to enable rapid solution development and evolution. Finally, the logical end point of these software / Cloud & AI capabilities is the concept of "virtual battery" where the cloud itself becomes an ultimate flexibility asset for the clean energy ecosystem. This talk will unwrap the various challenges and opportunities around this transition.



## **Dr. Vivek Raghavan**

Chief Project Manager & Biometric Architect,

Unique Identification Authority of India

Chief AI Evangelist, EkStep Foundation



More invited speakers and related abstracts shall be updated in due course



## Saket Anand

Associate Professor (CSE, ECE)  
IIIT Delhi

Title: Visual Wildlife Monitoring in India



**Abstract:** In this talk, I will begin with a sneak peek into the mammoth effort that is the All India Tiger Estimation (AITE), a pan-India effort organized every four years by the National Tiger Conservation Authority (NTCA) and executed by the Wildlife Institute of India (WII) with the support of all the state forest departments. I will then briefly talk about the Camera Trap Data Repository and Analysis Tool (CaTRAT) that enabled automated species-based segregation of 3.5 crore camera-trap images collected in the 2018-19 edition of AITE. Finally, I will present our recent research that exploits hierarchical knowledge to make 'better' mistakes while performing fine-grained recognition.

# ABOUT ORGANIZERS

## PLAKSHA UNIVERSITY

Situated at the foothills of the Himalayas in Chandigarh tricity, India, Plaksha University is a collective philanthropic initiative by a global community of 100+ reputed entrepreneurs, business leaders and academicians to reimagine technology education and research.

A greenfield university, Plaksha is developing a transformational model of engineering education and research that integrates technology, design, entrepreneurship, and liberal arts. Plaksha's mission is guided by an eminent Academic Advisory Board of distinguished leaders at top institutions and is anchored around three pillars:

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