Indian Society of Agricultural Information Technology (INSAIT)

Organizes

The Conference on

GeneRative AI for Nurturing Sustainable Agriculture (GRAINS) 2024

Call for Abstracts

Globally, one of the most critical challenges in the 21st century is to meet the food demand. Although significant progress has been made over the past half-century in reducing hunger and poverty and improving food security and nutrition, in recent times, the world has observed severe challenges, including climate change and the degradation of natural resources. We must shift our focus to sustainable and regenerative food production systems that will feed an ever-increasing population. The agricultural science and development communities want to expand the technologies and toolbox to help create efficient, economically, socially, and environmentally sustainable agricultural systems. One of the modern technologies that might help address the complex problems facing agriculture is the innovative applications of Artificial Intelligence. Shortly, more and more farms will participate in the farm modernization process. Policymakers and farmers will benefit from it to make better decisions. The challenge will lie in involving the resource-poor farmers in this transformative process.

About INSAIT

Information is just as critical a resource for people in rural areas as it is for those in urban areas. Instant access to information on the availability of inputs, financial resources, technological

innovations, and changing market conditions has become critical to the viability of the rural economy. How well the rural areas can respond to this information challenge will play a significant role in determining the future well-being of the rural communities, especially in developing countries like India.

In this context, it is prudent to extend the benefit of IT to agriculture and allied industries. In the future, there is tremendous potential for growth in this sector. Efforts in this direction would help extend the benefits of technological advances to rural people. As a first step in this direction, the Indian Society of Agricultural Information Technology (INSAIT), a professional society, was launched at Dharwad in 2000. INSAIT has organized several scientific meetings, workshops, and national and international conferences, including APFITA twice in 2006 and 2018.

The key objectives of INSAIT are as follows.

- To mobilize farmers, scientists, institutions, and organizations to promote agricultural IT.
- To encourage teaching, research, and extension activities in all aspects of agricultural IT.
- To provide a forum for information exchange and dissemination of agricultural information technology.
- Organize training programs and conventions and publish scientific information through different media to benefit the farming community.

About GenAIAg

Generative AI, or GenAI, refers to a subset of artificial intelligence techniques that enable machines to generate new content, whether text, images, or even entire datasets, by learning from existing data. Often based on advanced architectures like Generative Adversarial Networks (GANs) and Transformer models, these models can create highly realistic and contextually relevant outputs. The state-of-the-art in GenAI includes applications such as GPT-4 for natural language processing, DALL-E for image generation, and advanced models in domains like protein folding and drug discovery. These innovations push the boundaries of what AI can achieve, creating new opportunities for automation, creativity, and problem-solving across various fields.

Generative AI is revolutionizing the global agricultural sector. It's instrumental in creating solutions to meet the needs of a growing population, with innovations that analyze market demand, forecast prices, optimize farming practices, and monitor weather. It drives an agri-tech market predicted to reach USD 13.8 billion by 2031. At the World Agri-Tech 2024 event, Microsoft and other global leaders shared knowledge on building sustainable agri-food supply chains. The World Economic Forum's AI4AI initiative is strengthening collaborations to exploit opportunities and challenges of upcoming technologies in agriculture. Generative AI offers solutions that boost productivity, sustainability, and efficiency and is used in applications like crop productivity monitoring, soil

fertility, predictive agricultural analytics, and supply chain efficiencies. Integrating generative AI in agriculture enhances global food security by increasing crop yields and reducing waste.

Generative AI is also transforming agriculture in India. Indian farmers are leveraging AI to increase productivity sustainably. The "Saagu Baagu" project under AI4AI has enhanced yields and incomes for 7,000 Chilli farmers from Telangana, doubling their earnings through agritech and data management. Following its success, 'Saagu Baagu' is expanding to potentially impact 500,000 farmers across five value chains, demonstrating AI's vast potential in agriculture. However, smallholder farmers face challenges like erratic weather, climate change impacts, pest infestations, declining yields, and financial constraints. Post-harvest issues like crop wastage, logistics, and market access also pose problems. The adoption of generative AI in AgriTech in India is still evolving and may vary across regions and farm sizes. Factors such as infrastructure availability, data access, and affordability can influence the pace of adoption. The Indian agri-tech market, valued at USD 204 million, is expected to transform exponentially due to AI adoption and supportive government policies. In conclusion, generative AI is transforming agricultural activities globally and in the country, enhancing productivity and efficiency across the agricultural value chain.

Theme: Generative AI for Agriculture

Generative AI has immense agriculture potential to revolutionise practices and address critical challenges. By leveraging GenAI, farmers can benefit from precision farming techniques, which optimise resource use and enhance crop yields. For instance, GenAI can generate detailed simulations of crop growth under different environmental conditions, helping farmers make informed decisions about planting and harvesting. GenAI-powered predictive models can also forecast weather patterns and pest outbreaks, enabling proactive measures to protect crops. Moreover, GenAI can assist in breeding programs by analysing genetic data to create new, resilient crop varieties. The integration of GenAI in agriculture promises to enhance productivity, sustainability, and resilience, ultimately contributing to global food security.

Topics of Interest

We invite researchers, practitioners, and industry experts to submit original research papers, case studies, and reviews on the following topics related to Generative AI for Agriculture, including but not limited to:

- ***Precision Farming:*** Applications of GenAI in optimising resource usage, enhancing crop yields, and reducing environmental degradation.
- ***Crop Simulation Models:*** Development and application of GenAI to simulate crop growth under various environmental conditions.
- ***Predictive Modeling:*** Use of GenAI for forecasting weather patterns, pest outbreaks, and other critical agricultural events.

- ***Breeding Programs:*** GenAI in analysing genetic data to develop new crop varieties with enhanced resilience and productivity.
- ***Sustainability:*** GenAI's role is to promote sustainable agricultural practices and reduce the carbon footprint of farming activities.
- ***Automation:*** Innovations in agricultural automation using GenAI for tasks such as planting, monitoring, and harvesting.
- ***Data Generation:*** Techniques for generating synthetic agricultural data to improve model training and validation.
- ***Case Studies:*** Real-world applications and impact of GenAI in agricultural settings.

Submission Guidelines

Prospective authors are invited to submit an approximately 300-word one or two-page abstract. The submissions will be accepted through https://easychair.org/conferences/?conf=grains2024

All submitted abstracts will be peer-reviewed by at least three program committee members. At least one author of each accepted abstract must register and present the research at the conference. Accepted and presented abstracts will be considered for chapters to be included in an edited book, "Generative AI in Agriculture," Same as the Conference title.

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Important Dates

- Submission of Abstract: September 15, 2024
- Notification of Acceptance: October 1, 2024
- Submission of final version of the abstract: October 15, 2024
- Conference Dates: October 25-26, 2024

Venue

Ahmedabad University, Navrangpura, Ahmedabad - 380009, Gujarat, India

Contact Information:

For more details on submission guidelines and conference updates, please visit us

Join us in exploring the transformative potential of **Generative AI for Agriculture** and contribute to shaping the future of sustainable and resilient farming practices.