Veer Madho Singh Bhandari
Uttarakhand Technical University
Dehradun, Uttarakhand - India

Announces

National Competition for Indigenous Chatbot Development

DEEP-SHIVA

Open Source LLM for Agriculture, Healthcare & Tourism

Veer Madho Singh Bhandari Uttarakhand Technical University, Dehradun, hereafter referred to as VMSBUTU is organizing a National Level Competition for development of **"Deep-Shiva: Open Source LLM for Agriculture, Healthcare & Tourism"** which is open to UG/PG students of engineering and technology from all of the Indian technical institutions & universities. The competitive event for developing "**Deep-Shiva**" draws its inspiration from the call given by **Lt Gen Gurmit Singh,** PVSM, UYSM, AVSM, VSM (Retd), **Hon'ble Governor of Uttarakhand** and **Chancellor** of the Veer Madho Singh Bhandari Uttarakhand Technical University, Dehradun on 14th May 2025. This competition will encompass the design and development of AI based Chatbot in the following categories:

- **Agriculture**
- **Healthcare**
- **Tourism**

PARTICIPATION AND EVALUATION: A team of 4-6 bonafide students may register using the following link for participation in any one of the categories listed above: https://bit.ly/Deep-Shiva

The stages of participation and evaluation are as following:

Stage I - Based on the entries received by the due date, the teams will be asked to demonstrate their capabilities on the given problem statement(s) for carrying out 1st preliminary filtering for capability assessment. The assessment will be done in phases (up to 4 phases of assessment) by experts from academia/industry. The individual team member will be assessed separately about his/her contribution and may be mingled with other team members after consent of the team

lead to build a specialized project team called **'Potential Team'**. This would be the basis of selecting the Potential Teams as such or reconstituting them as per the capabilities of individual team members for successful completion of the project in respective categories subject to mutual consent of the team members. Thus, Stage I will be used for selecting/reconstituting the potential teams in limited numbers for each of the categories.

Stage II – After the teams have been selected/reconstituted in Stage I, these will be designated as 'Potential Teams'. Once, the Potential Teams are notified, then no change in Team Member will be considered. Any desired change in Potential Team after its notification and use of any influence in the evaluation process will lead to the debarring of the Potential Team. These 'Potential Teams' will be working for the development of Open Source LLM-powered ChatBot for respective categories i.e. Agriculture, Healthcare, and Tourism. In case of the requirement, the VMSBUTU may assign a mentor to the team(s) for overall guidance in completing their project, however, the necessary facilities for the development will have to be arranged by the respective team. Nevertheless, the limited facilities as available in the AI R&D Hub of the VMSBUTU may be provided to the teams asking for it. It is worth mentioning that the assignment of mentors, facilities, etc. will not be influencing the overall development of the Chatbot by the 'Potential Teams' and cannot be claimed in any way during the final evaluation. As a part of the final evaluation, the VMSBUTU reserves the right to make a periodical assessment of the progress/performance of the 'Potential Teams'. The detailed final evaluation criteria will be announced after the constitution of the 'Potential Teams'. The assessment will be done in phases (up to 4 phases of assessment) by the experts from academia/industry. It is mandatory for the Potential Team to mention the name of VMSB Uttarakhand Technical University in all development and proceedings till the declaration of final results.

Intellectual Property: The prize-winning Chatbot models along with an appropriate open-source license will be submitted to the VMSB Uttarakhand Technical University, Dehradun by the respective "Potential Teams". The respective Potential Teams will be responsible for any change/modification in the ChatBot until its finalization.

LAST DATE TO APPLY (STAGE-I): 30TH JULY 2025

LAST DATE TO SUBMIT THE FINAL CHATBOT: 15TH DECEMBER 2025

National Level Competition for development of ***"Deep-Shiva: Open Source LLM for Agriculture, Healthcare & Tourism"***

Prizes: The Potential Teams developing the Open Source LLM-powered Chatbot from all three categories will be evaluated together and the best three teams will be given the following prizes subject to the fulfilment of all requirements laid down by the UTU:

- ❖ **1st Prize – Rs. 5,00,000/- (Five Lac Only)**
- ❖ **2nd Prize – Rs. 3,00,000/- (Three Lac Only)**
- ❖ **3rd Prize – Rs. 2,00,000/- (Two Lac Only)**

Mode of Communication: E-mail (deep-shiva@uktech.net.in) will be the only mode of communication between VMSBUTU and the participants. Communications received in any other mode will not be considered.

Modification to Rules: VMSBUTU reserves all rights to make any changes in the terms & conditions and other details given herein with prior notice to participants.

Liability: VMSBUTU will not be responsible for any technical issues, loss of data, or other problems that may arise during this competition aiming at development of Chatbots.

Data Privacy: Participants are required to agree to the use of their project details or media for promotional purposes by VMSBUTU.

Code of Conduct: VMSBUTU will not be tolerating to harassment, discrimination, or inappropriate behaviour of any participants during the competition.

Disputes and Arbitration: The decision of the VMSBUTU will be final in case of any dispute arising during the competition.

CORE TEAM AND CONTACT POINTS:

Dr. Amit Agarwal	**Dr. Rashmi Saini**	**Dr. Vishal Kumar**
Convener	**Co-Convener**	**Co-Convener**
Mobile No: 8755196688	Mobile No. 9412113642	Mobile No: 8193098151

Veer Madho Singh Bhandari Uttarakhand Technical University, Dehradun (Uttarakhand) - INDIA
Email: deep-shiva@uktech.net.in   website: www.uktech.ac.in

PATRON:

Prof. (Dr.) Onkar Singh
Hon'ble Vice Chancellor
Veer Madho Singh Bhandari Uttarakhand Technical University, Dehradun– INDIA

National Level Competition for development of ***"Deep-Shiva: Open Source LLM for Agriculture, Healthcare & Tourism"***

[A]
Deep-Shiva: Indigenous AI Chatbot Competition

"Deep-Shiva" focuses on the design of domain-specific LLM-powered Chatbots in the three key areas namely Agriculture, Healthcare and Tourism. Just like the Trident of Lord Shiva, this competition will focus on three domain sectors.

Note: Each team can participate in only one problem statement.

Problem Statement 1: Domain-Specific LLM-powered Chatbot for Agriculture

Problem Statement 2: Domain-Specific LLM-powered Chatbot for Healthcare

Problem Statement 3: Domain-Specific LLM-powered Chatbot for Tourism

General Guidelines for Participating Teams:

To design an outperforming AI Chatbot ("Deep-Shiva"), teams must adhere to the following guidelines while addressing any one of the three problem statements (Agriculture, Healthcare, and Tourism).

1. Team Structure & Roles

Each team must consist of **4-6 members** with clearly defined roles:

Role	Responsibilities
Project Lead	Oversees overall strategy, timeline management, team coordination, and stakeholder communication.
AI/ML Engineer	Responsible for LLM fine-tuning, embeddings, reasoning capabilities, and model evaluation.
Backend Developer	Manages API integrations, real-time data access (e.g., IMD, AGMARKNET), and database systems.
Frontend Developer	Designs and implements user interface (UI/UX) for chatbot/web/mobile platforms.
Domain Expert (Agri/Health/Tourism)	Ensures domain-specific correctness, contextual relevance, and alignment with regional needs.
Data Engineer (Optional)	Develops and maintains data pipelines, processes multilingual datasets, and supports blockchain validation.

2. Architecture Overview

The proposed Deep-Shiva architecture should include:

Component	Description
LLM Core	Fine-tuned open-source models (e.g., Llama 3, Mistral) or custom models tailored for local context and accuracy.
Knowledge Retrieval	Retrieval-Augmented Generation (RAG) to fetch relevant domain-specific information from curated datasets.
Conversational Memory	Mechanisms to handle short-term and long-term context for maintaining coherent and personalized conversations.
Real-time Data Integration	APIs for integrating weather (IMD), health advisories (MoHFW, e-Sanjeevani), and tourism updates (Char Dham, etc.).
Multilingual Support	NLP models for regional languages such as Hindi, Gujarati, Telugu, Tamil, Punjabi etc. to improve accessibility.
Validation Layer	Validation using trusted sources and algorithms to ensure factual correctness and trust in critical responses.

3. Differentiation Strategy (Unique Features & Use Cases)

To outperform existing chatbots, teams must focus on:

A. Accuracy & Reasoning Ability

- Chain-of-Thought (CoT) prompting for logical reasoning in agriculture (e.g., crop disease diagnosis).
- Mathematical & Logical Problem Solving for healthcare (e.g., dosage calculations).
- Contextual Memory for personalized yoga/wellness recommendations.

B. Speed & Latency Optimization

- Quantized models for faster inference on edge devices.
- Caching mechanisms for frequent queries.

C. Real-time & Personalized Data Access

- Farmers' helpline integration (govt. APIs for weather, soil health).
- Ayushman Bharat/Healthcare APIs for medical advice.
- Tourism department data for real-time trekking/yoga retreat updates.

D. Multilingual & Emotionally Intelligent Responses

- Sentiment analysis to adjust chatbot tone (e.g., empathetic responses for medical queries).
- Voice-based interaction for rural users (support for regional dialects).

E. Safety & Fact-Checking

- Blockchain-based validation for critical answers (e.g., medicinal prescriptions).
- Moderation layer to filter harmful/biased content.

4. Tools & Tech Stack Recommendations

Category	Suggested Tools/Technologies
LLM Framework	Hugging Face, LangChain, LlamaIndex
Fine-tuning	LoRA, QLoRA, PEFT
Backend	FastAPI, Flask, GraphQL
Database	PostgreSQL, Pinecone (vector DB)
Frontend	React.js, Flutter, Streamlit
Multilingual NLP	IndicBERT, Bhashini API
Blockchain	Ethereum/Smart Contracts, Hyperledger (for validation)
Deployment	Docker, Kubernetes, ONNX Runtime

The teams may use other existing tools available for fine tuning of proposed chatbot.

5. General Evaluation Criteria

Submissions will be judged on:

Criteria	Description
Accuracy & Relevance	Ensures domain-specific correctness (e.g., agriculture, healthcare, tourism) with factual and scientific grounding.
Reasoning Ability	Measures logical thinking, problem-solving, mathematical reasoning, and Chain-of-Thought (CoT) performance.
Latency & Hardware Efficiency	Evaluates model responsiveness and optimization for low-resource or edge devices (e.g., rural smartphones).
Innovation in Use Cases	Assesses novelty and creativity in applying solutions to Uttarakhand-specific challenges and local needs.
Multilingual & Emotional Intelligence	Supports Hindi, Gujarati, Telugu, Bengali etc. and demonstrates empathy, sentiment analysis, and user-friendly communication.
Safety & Validation Mechanism	Incorporates blockchain, cryptographic tools, or fact-checking layers to ensure secure and trustworthy information delivery.

6. Final Submission Requirements

Deliverable	Description
Technical White Paper	A detailed document explaining your team's technical approach, system architecture, methodology, benchmarks, and innovations for building the domain-specific LLM (Agri/Health/Tourism).
Demo Video	A functional walkthrough of the chatbot showcasing real-world use cases, UI interaction, and key features in action.
GitHub Repository	Public repo with clean, documented codebase, dataset links, fine-tuning scripts, model configs, and deployment instructions.
Pitch Deck	A concise, visually engaging presentation demonstrating business viability, scalability, and impact — tailored for stakeholders, policymakers, or funding agencies.

[B]
Deep-Shiva - Specific Guidelines

To ensure "Deep-Shiva" effectively addresses the unique challenges of Agriculture, Healthcare and Tourism, the Potential Teams must follow these sector-specific guidelines. However, the VMSBUTU reserves all rights to make any changes in the terms and conditions of this competitive event.

Guidelines for Domain-Specific LLM-powered Chatbot for Agriculture

Farmers across India face difficulties in accessing timely, accurate, and personalized agricultural advice due to language barriers, fragmented data sources, and lack of digital literacy. Your task is to develop a multilingual AI-powered chatbot tailored for the agriculture sector that provides farmers with real-time advisory services on weather forecasts, crop management, market prices, pest control, and government schemes.

Suggestive Problem Focus:
- Crop Disease Diagnosis & Remediation
- Soil Health & Irrigation Advisory
- Government Scheme Awareness (PM-KISAN, Soil Health Card, etc.)
- Any other as deemed suitable for agriculture

Key Requirements:

- **Hyperlocal Knowledge Base**
  - Fine-tune LLM on specific crop data (e.g., Basmati Rice, Mandua, Apples).
  - Integrate real-time weather APIs (IMD, NASA Soil Moisture Data).
  - Support regional dialects for voice-based queries.

- **AI-Powered Advisory System**
  - Image Recognition for pest/disease detection (via smartphone uploads).
  - Precision Farming Tips (water conservation, organic farming).
  - Blockchain-based Verification for govt. subsidy eligibility checks.

- **Low-Resource Optimization**
  - Edge-compatible model (farmers may use low-end smartphones).
  - Offline Mode for areas with poor connectivity, Implement offline capability or edge deployment for rural areas with low connectivity.

- **Others**
  - Support regional Indian languages (e.g., Hindi, Telugu, Marathi).
  - Use retrieval-augmented generation (RAG) for fetching real-time data from Agri APIs, meteorological sources, and local databases.
  - Enable voice interaction for digitally less-literate farmers.
  - Integrate GIS mapping to provide localized recommendations.
  - Add guardrails to ensure factual correctness in sensitive advice.

Tech Stack Suggestions:

- Vision Model: YOLO, ResNet (for disease detection).
- Agriculture APIs: Kisan Suvidha, mKisan.
- Language Model: Fine-tuned IndicBERT for Hindi + dialects.
- Any other as deemed suitable for agriculture

Judging Criteria:

Criteria	Details	Weightage
Accuracy of Agri-Advisory	- Correct diagnosis of crop diseases (with scientific references)- Precise soil/irrigation recommendations- Validated by agricultural experts.	30%
Localization & Language Support	- Supports Hindi & Other Regional Languages- Voice-based queries for illiterate farmers- Hyperlocal data (e.g., Mandua farming in Uttarakhand).	20%
Real-Time Data Integration	- Weather alerts (IMD API)- Market prices for crops (e-Kisan, AGMARKNET) - Govt. scheme updates (PM-KISAN, Soil Health Card).	20%
Offline & Low-Bandwidth Functionality	- Works without internet (edge AI)- Lightweight model for low-end smartphones.	15%
Innovation in Problem-Solving	- Blockchain for subsidy verification- AI-powered pest detection via images- Predictive analytics for crop yield.	15%

Guidelines for Domain-Specific LLM-powered Chatbot for Healthcare

Patients often struggle with delayed responses, language gaps, and misinformation in accessing preliminary healthcare information. Your challenge is to design a secure, emotionally intelligent AI chatbot for healthcare that can provide pre-diagnosis assistance, mental health support, hospital information, and emergency protocols, while maintaining sensitivity and privacy.

Suggestive Problem Focus:

- Ayurveda & Yoga-Based Wellness Guidance
- Remote Diagnosis (Symptom Checker)
- Integration with Ayushman Bharat & Govt. Health Schemes
- Any other as deemed suitable for healthcare

Key Requirements:

- **Medical Accuracy & Safety**
  - Fact-Checked Responses (cross-verified with AYUSH ministry guidelines).
  - Drug Interaction Alerts (for Ayurvedic + Allopathic medicine conflicts).
  - Emergency Triage System (redirect to nearest hospital if critical).

- **Personalized Wellness (Yoga & Ayurveda Focus)**
  - Customized Yoga Plans (based on age, health conditions).
  - Dietary Recommendations (Uttarakhand-specific herbs like Giloy, Brahmi).
  - Sentiment Analysis for mental health support (e.g., stress-relief tips).

- **HIPAA-like Compliance for India**
  - Anonymized User Data (no PII storage), Ensure data privacy.
  - Blockchain-Based Audit Trail for prescriptions.
  - Use blockchain or verifiable credentials to validate health responses and avoid hallucinations.

- **Others**
  - Understand and respond empathetically using sentiment analysis.
  - Support multimodal input (symptom images, speech-to-text).
  - Offer multi-language interaction, including Hindi, Bengali, Tamil.
  - Integrate with government health APIs (like Ayushman Bharat or local PHCs).

Tech Stack Suggestions:

- Medical LLM: Fine-tuned on PubMed, AYUSH datasets.
- APIs: e-Sanjeevani, Nikshay (TB program), Ayushman Bharat.
- Security: Homomorphic Encryption for sensitive queries.

*National Level Competition for development of **"Deep-Shiva: Open Source LLM for Agriculture, Healthcare & Tourism"***

Judging Criteria:

Criteria	Details	Weightage
Medical Correctness & Safety	- No hallucinated medical advice- Cross-checked with AYUSH/WHO guidelines- Drug interaction warnings.	30%
Personalized Wellness (Yoga/Ayurveda)	- Customized yoga routines (for back pain, stress)- Diet plans using local herbs (Giloy, Ashwagandha)- Mental health sentiment analysis.	25%
Emergency & Triage Support	- Detects critical symptoms (e.g., heart attack, snakebite)- Redirects to nearest hospital/e-Sanjeevani telemedicine.	20%
Multilingual & Voice Support	- Hindi + regional dialects- Voice-guided meditation.	15%
Privacy & Compliance	- No PII (Personal Identifiable Information) storage- Blockchain audit for prescriptions.	10%

Guidelines for Domain-Specific LLM-powered Chatbot for Tourism

Tourists visiting culturally rich but less digitized regions struggle with finding local information, navigating services, and connecting with heritage. Your task is to build a multilingual, context-aware AI chatbot for tourism that assists travellers with itinerary planning, site information, accommodation, emergency services, and local culture exploration.

Suggestive Problem Focus:

  - Personalized Yoga & Meditation Guides
  - Spiritual Tourism Itineraries (Char Dham, Ayodhya, Dwarika, Jagannath Puri, etc)
  - Eco-Trekking & Homestay Recommendations
  - Any other as deemed suitable for tourism.

Key Requirements:

● **Cultural & Spiritual Context Awareness**
  - Mythology-Infused Responses (e.g., "What is the significance of Kedarnath?").
  - Multilingual Support (Hindi, English, and Sanskrit for shlokas).
  - Voice-Guided Meditation (with ambient nature sounds).
  - Include audio-guided tours in regional languages.

● **Real-Time Tourism Assistance**
  - Crowd Prediction (peak seasons at Badrinath, Kedanrnath, Hemkund Sahib, etc.).
  - Homestay/Affordable Stay Recommendations (integrate Tourism API).
  - Eco-Tourism Tips (waste management, sustainable trekking).

● **Personalized Wellness Journeys**
  - AI Yoga Trainer (corrects postures via image analysis).
  - Diet Plans (local cuisines like Kafuli, Jhangora Kheer, etc.).
  - Sentiment-Based Recommendations (e.g.,"I feel stressed →Suggest a silent retreat in Munsiyari").

● **Others**
  - Support dynamic persona switching (e.g., local guide, culture expert, travel assistant).
  - Provide real-time data using APIs for weather, transport, accommodation.
  - Use GIS mapping and QR-code interaction at physical tourist sites.
  - Capable of offline functionality in remote destinations.
  - Integrate with local artisan data to promote cultural heritage and e-commerce.

*National Level Competition for development of **"Deep-Shiva: Open Source LLM for Agriculture, Healthcare & Tourism"***

Tech Stack Suggestions:

- NLP for Sanskrit/Hindi: Bhagavad Gita, Yoga Sutras dataset.
- APIs: Uttarakhand Tourism, Google Maps (trekking routes).
- AR/VR: 360° virtual tours of temples/yoga retreats.
- Any other as deemed suitable for Tourism

Judging Criteria:

Criteria	Details	Weightage
Cultural & Mythological Relevance	- Explains significance of Char Dham, Ayodhya, Dwarika, Jagannath Puri, etc - Quotes from Bhagavad Gita/Yoga Sutras- Supports Sanskrit shlokas.	25%
Real-Time Travel Assistance	- Crowd predictions at Char Dham, Ayodhya, Dwarika, Jagannath Puri, etc - Homestay/eco-resort recommendations- Trekking route updates (GMaps API).	25%
Personalized Yoga/Meditation Guide	- AI posture correction (via pose estimation)- Mood-based meditation recommendations- Local diet plans (e.g., Jhangora Kheer).	20%
Multilingual & Accessibility	- Hindi + English + regional dialects- Voice-guided tours for visually impaired.	15%
Sustainability & Eco-Tourism	- Promotes plastic-free travel- Recommends eco-friendly stays- Carbon footprint calculator.	15%