



INDIAN INSTITUTE OF TECHNOLOGY PATNA

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Date 3rd November, 2025

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03/11/2025

Certificate of Research Internship

This is to certify that **Ms. Sahili Gaurkhede** has successfully completed a Research Internship at the Indian Institute of Technology Patna from May 16, 2025 to October 16, 2025 under my supervision.

During this internship, the student worked on a research project titled **Cultural Reasoning on Indian Culture**, focusing on the Creation of cultural reasoning questions and the execution of inference with multiple models on the dataset.

Ms. Sahili Gaurkhede worked on the development of a **Large Language Model-based framework for multi-hop question answering under the Project: Cultural Reasoning on Indian culture**. Her work involved data collection and curation from diverse web sources, text preprocessing, and dataset structuring to support multi-context reasoning. She experimented with advanced models such as **Gemma-3-4B-IT**, **Phi-4-Mini-IT**, and **Qwen-3-32B**, focusing on model inferencing and evaluation, and comparative performance analysis. Her contribution strengthened the project's efforts toward building efficient and context-aware Indian language LLM systems.

During the course of the internship, **Ms. Sahili Gaurkhede** demonstrated the following skills with great proficiency:

- **Programming Languages:** Python, SQL

- **Frameworks and Libraries:** Hugging Face Transformers, PyTorch, NumPy, Pandas, Matplotlib



- **Software and Platforms:** Google Colab, GitHub,

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- **Techniques:** Data Collection and Preprocessing, Multi-hop Question Answering, , Dataset Structuring for Multi-context Reasoning

Best Regards,

Sriparna Saha

Dr. Sriparna Saha