

The background features a large, central, light green circle with a subtle gradient. This circle is surrounded by several concentric, semi-transparent layers of the same color, creating a soft, glowing effect. The overall design is clean and modern, with a focus on the central text.

SAPIEN

Skillful Atmospheric Predictions with
IntelligEnt Networks

Project Introduction

Objective:

- We aim to leverage LUMI's GPU capabilities to train two machine learning models: **LDcast** and **SHADEcast**.
- **LDcast** is a cutting-edge model for **precipitation nowcasting**, designed to predict short-term rainfall patterns using **high-resolution radar data**.
- **SHADEcast** is a complementary model for **solar irradiance nowcasting**, leveraging satellite data to predict solar radiation levels.
- Both models utilize **latent diffusion models**, a type of generative AI architecture, optimized for rapid and accurate predictions in real-time applications.

Key Applications:

- These models provide critical forecasting tools for weather-sensitive sectors such as **renewable energy, agriculture, and disaster management**.

Current Status

Code Status:

Training pipeline is fully developed and has been successfully run on NVidia GPUs.

Action Required: Need support to adapt the code for AMD GPUs (PyTorch dependency).



Next Steps: Containerize LDcast in LUMI to make it easily deployable across the system.

Primary Goal (4 Days of Work)

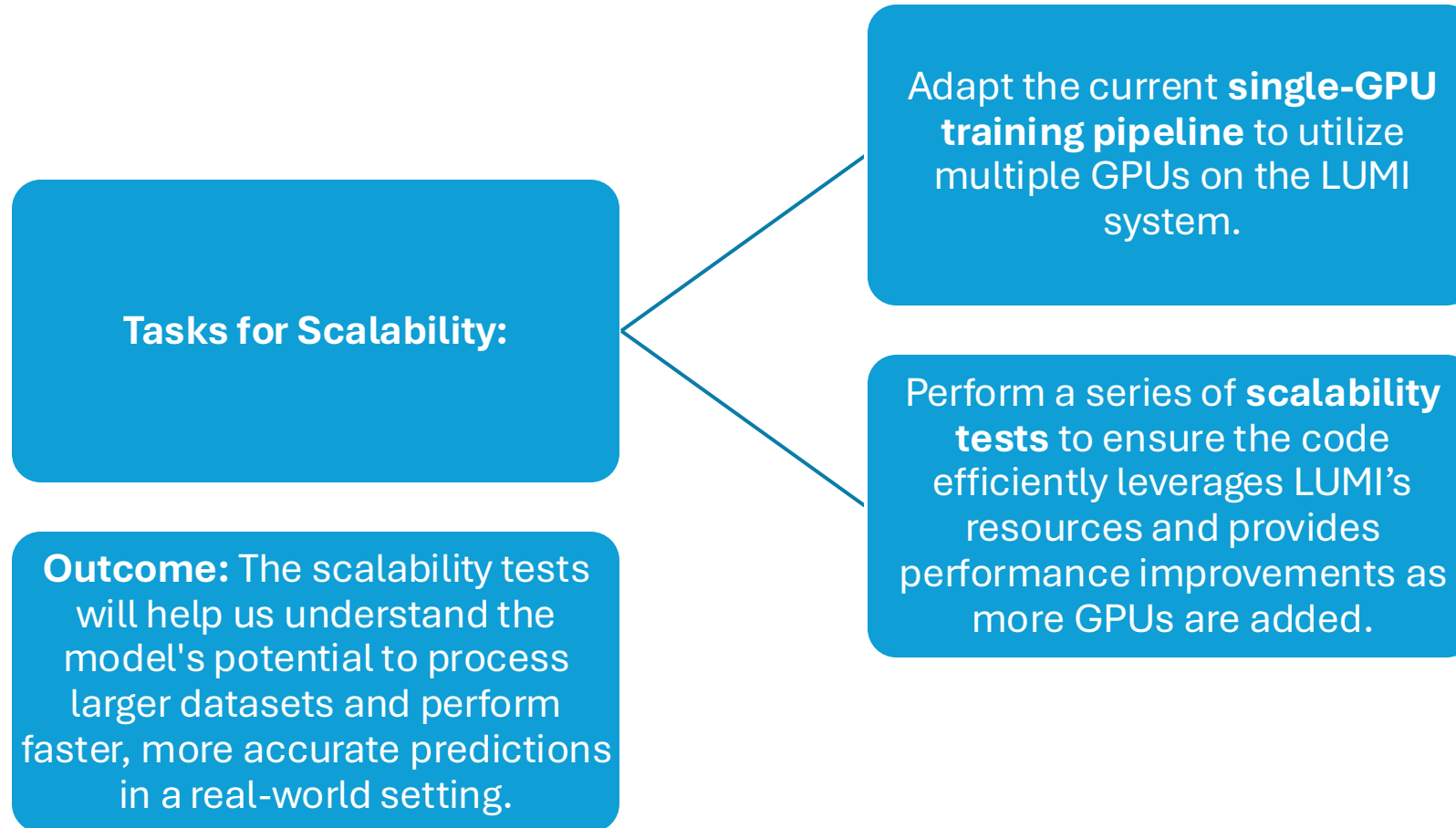
LDcast on LUMI:

- Containerize the LDcast model and run it efficiently on a single GPU of LUMI.
- **Stretch Goal:** Adapt the code to run on multiple GPUs for scalability.

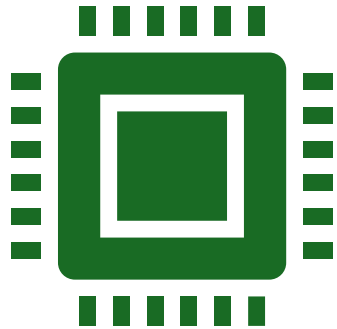
Scaling Up:

- Begin scaling LDcast across multiple GPUs, focusing on optimizing for LUMI's architecture.
- If time allows, explore deploying SHADEcast after achieving a scalable LDcast pipeline.

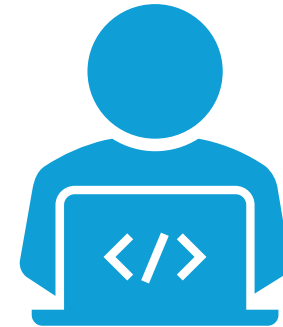
Plan for Scalability



Challenges & Support Needed



AMD Support: Need assistance to ensure smooth deployment on AMD GPUs.



PyTorch Adaptation: PyTorch adjustments to accommodate LUMI's architecture for multi-GPU scaling.

Resources

- LDCast
<https://github.com/MeteoSwiss/ldcast>
- SHADECast
<https://github.com/EnergyWeatherAI/GenerativeNowcasting>





Thank you :)