

LlamaRural

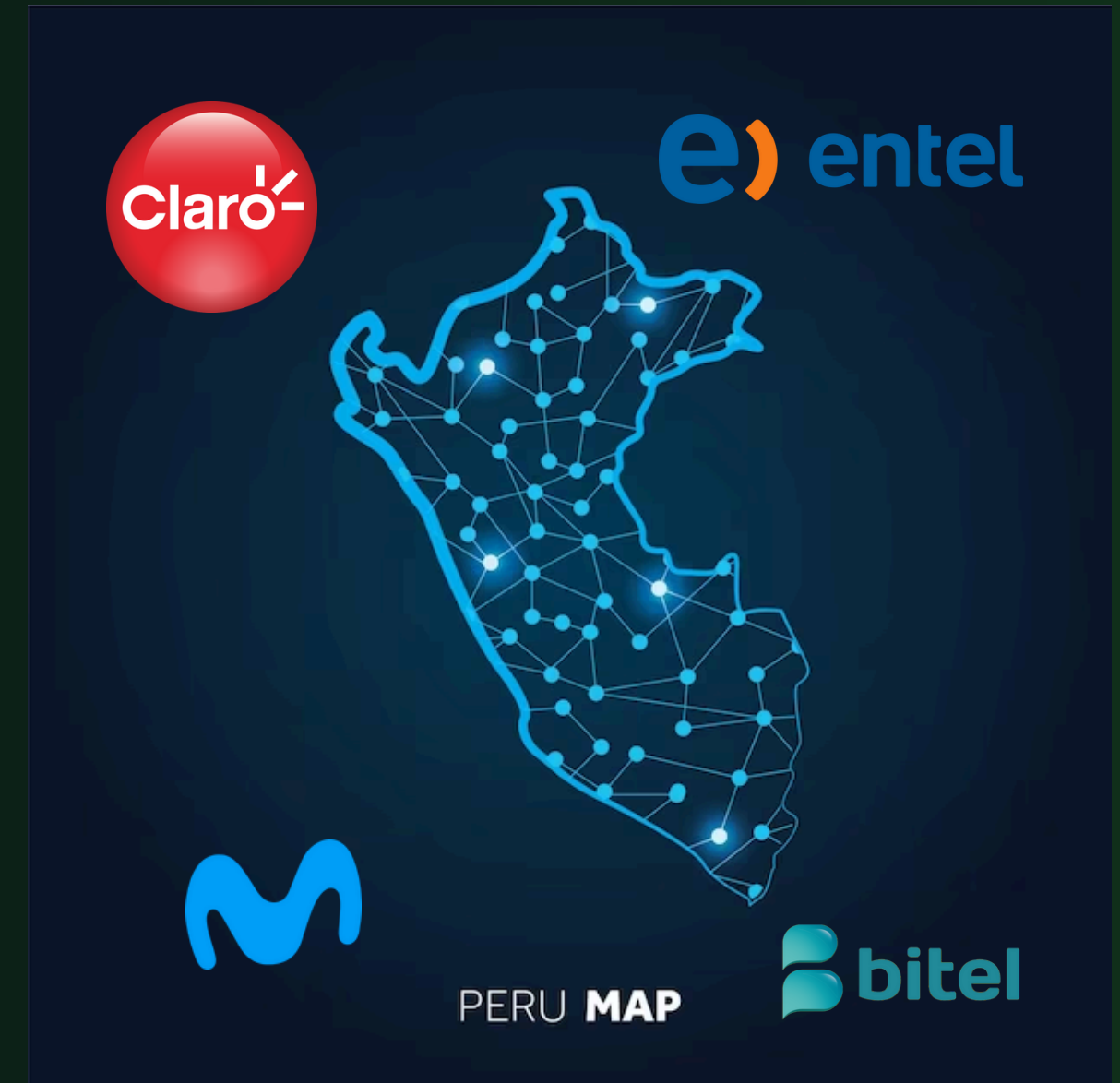
Application to analyze mobile coverage in rural areas of Peru using interactive maps and the power of LLMs

01 >>> Problem

Rural areas in Peru face limitations in mobile coverage, affecting access to telecommunications services.



In Peru, four main companies are responsible for telephone services: Movistar, Claro, Entel and Bitel. However, the distribution of antennas is not homogeneous, which means that in some areas there may be a signal for one operator, but not for another.

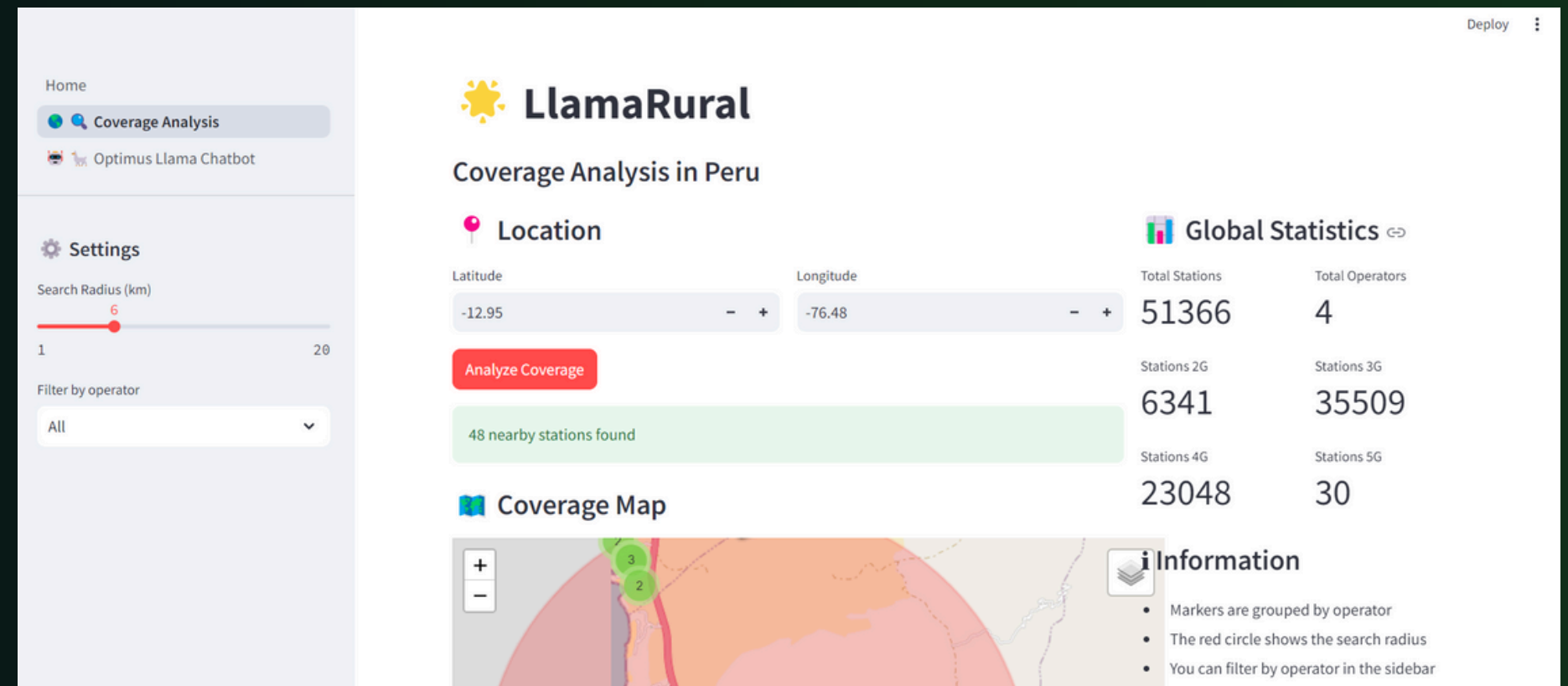
Since there is no coverage, there is also no internet access, making it difficult to access vital information on first aid, education, health, among other topics.



02 >>> Solution

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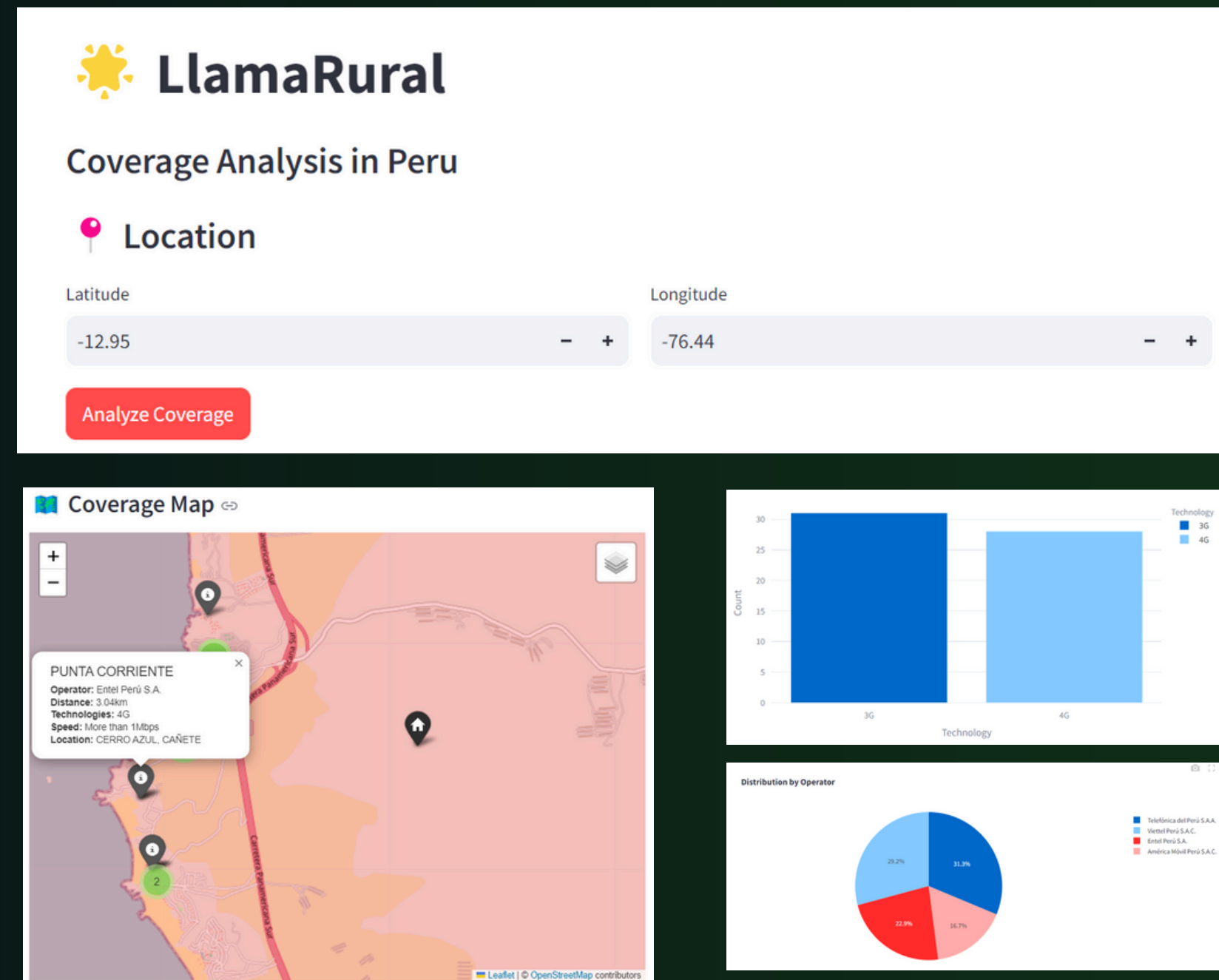
-  Coverage Analysis
-  Optimus Llama Chatbot



02 >>> Solution

Coverage Analysis:

- Coverage map by operator and technology (2G, 3G, 4G, 5G) according to the chosen location.
- Operator panel with key metrics to identify the advantages





02 >>> Solution


Optimus LLama Chatbot

- Optimus LLama Chatbot interacts with users using Llama 3.2 3B models (for general objectives) and Llama 3.1 405B (for complex problems) and using location data for responses where connectivity problems need to be solved.

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 Optimus LLama Chatbot

 What are the closest places to get a signal?

 Based on the location data, here are the closest places to get a signal:

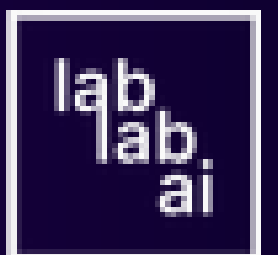
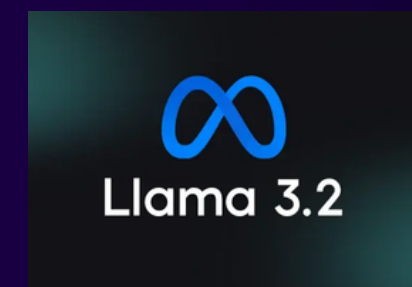
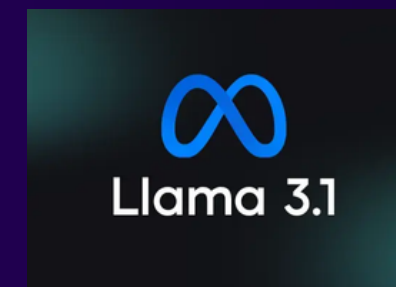
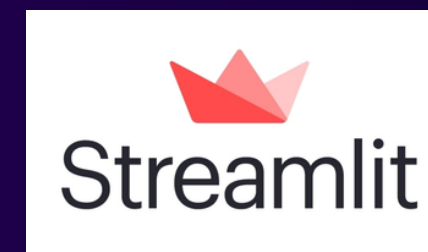
1. **SANTA ROSA** (3.45 km, 3G, 4G) - This is the closest location to get a signal, with a distance of 3.45 km from the current location.
2. **EL TIGRE** (4.93 km, 3G, 4G) - This location is 4.93 km away from the current location, but it still offers good signal strength.
3. **EL 25** (4.39 km, 3G, 4G) - This location is 4.39 km away from the current location, and it offers good signal strength as well.
4. **FRAY RAMON** (4.86 km, 3G, 4G) - This location is 4.86 km away from the current location, but it still offers good signal strength.

Please note that these distances are approximate and may vary depending on the specific location within the area.

Model Used: meta-llama/Llama-3.2-3B-Instruct-Turbo

03 >>> Tech

- Programming Language: Python
- Frontend Framework: Streamlit
- LLM:
 - Llama 3.1 405B (complex tasks)
 - Llama 3.2 3B (general tasks)
- Libraries:
 - Folium: Interactive maps (with Leaflet)



04 >>> Demo

05 >>> Target audiences

- Rural communities in Peru facing connectivity issues
- Mobile operators interested in improving coverage in remote areas
- Authorities and government entities focused on reducing the digital divide
- NGOs working in health, education, and community development

06



Future Work

- **Develop a mobile app:** This would eliminate the need for users to access a website to check coverage, offering a more accessible and streamlined experience.
- **Implement the Llama 3.2 3B model for basic functions:** By integrating this model, users without internet access could still obtain essential information offline.
- **Add a no-coverage alert system:** In areas where users experience connectivity issues, the app could automatically generate a report to the regulatory telecommunications authority, improving network oversight and accountability.

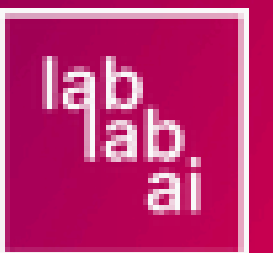
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Thank You

