Lace

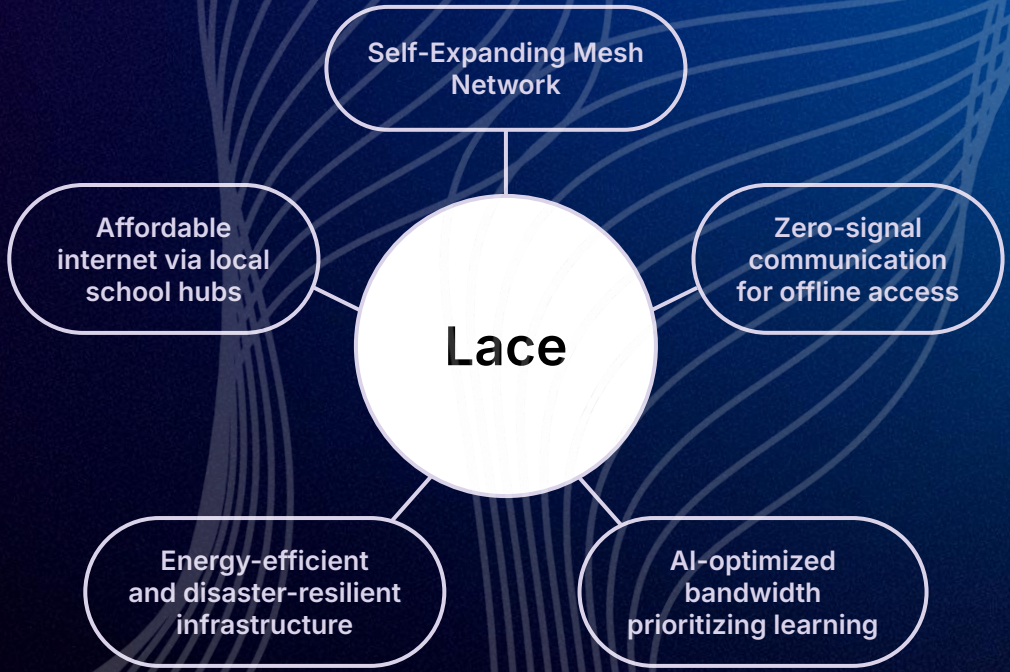
AI-Powered Intelligent Mesh Network (IMN) for Universal Access to Learning

Team: **Lace**

Lablab AI for Connectivity Hackathon II: **Building Resilient Networks**

Summary

An innovative solution bridging the digital divide in education for rural students utilizing AI-driven, self-expanding mesh networks to connect schools and communities, incorporating zero-signal communication for offline access and AI-optimized bandwidth allocation.



The Problem

- 2.9 billion people worldwide lack internet access
- Educational inequality persists globally due to limited internet connectivity
- Remote and underserved areas struggle with traditional broadband
- Disaster-prone regions face frequent disruptions in connectivity

Challenges

- Limited infrastructure in remote areas
- High costs of traditional broadband deployment
- Unreliable power supply in many regions
- Need for offline access to educational content
- Bandwidth constraints in developing areas






Solution:
Lace

Smart Growth

AI-driven self-expanding mesh network

Access Everywhere

Zero-signal communication for offline resources

Smart Optimization

AI-optimized bandwidth allocation

Resilient

Self-healing, disaster-resilient nodes

Impacts

Providing affordable, reliable access to resources in areas lacking traditional broadband, can significantly reduce educational and economic disparities between urban and rural areas.

The system's ability to operate with minimal infrastructure makes it valuable during natural disasters or other crises, ensuring continued access to critical information and services.

Lace can be applied to a wide variety of uses, including telehealth.

Bridging the digital divide in access

Improved access to education

Telehealth for remote areas

Enhanced community connectivity

Harnesses existing infrastructure

Minimal energy and bandwidth use

Markets

EdTech
$253 B

The global EdTech market is projected to reach $253.9 billion by 2033, growing at a CAGR of 12%

Telehealth
$759 B

The global Telehealth market was valued at approximately $101-120 billion in 2023 and is expected to reach $851-1,186 billion by 2032-2034, growing at a CAGR of 23.7-25.7%

Defense
$60B

Combined communication segments of the defense industry (Tactical Comms $20B, Military Comms $40B)

Revenue Streams

Our goals is to offer free services to underserved areas, sustained by revenue from high-value markets like EdTech, Telehealth, and Defense. This cross-subsidization model ensures our mission's long-term viability while expanding our impact.

EdTech

- Subscription fees for schools and educational institutions
- Licensing of AI-optimized bandwidth allocation technology
- Data analytics services for personalized learning

Health

- Subscription models for ongoing care and remote monitoring
- Licensing fees for telehealth platforms using our mesh network technology

Defense

- Government contracts for tactical battlefield communications
- Licensing of zero-signal communication technology
- Subscription fees for secure, resilient network services
- Custom solutions for military applications (e.g., autonomous systems integration)

Technology Used

Steamlit

Interface

Folium

Map

OpenAI

AI query processing

GeoPandas

Handling geospatial data

Shapely

Working with geographic coordinates

Scipy

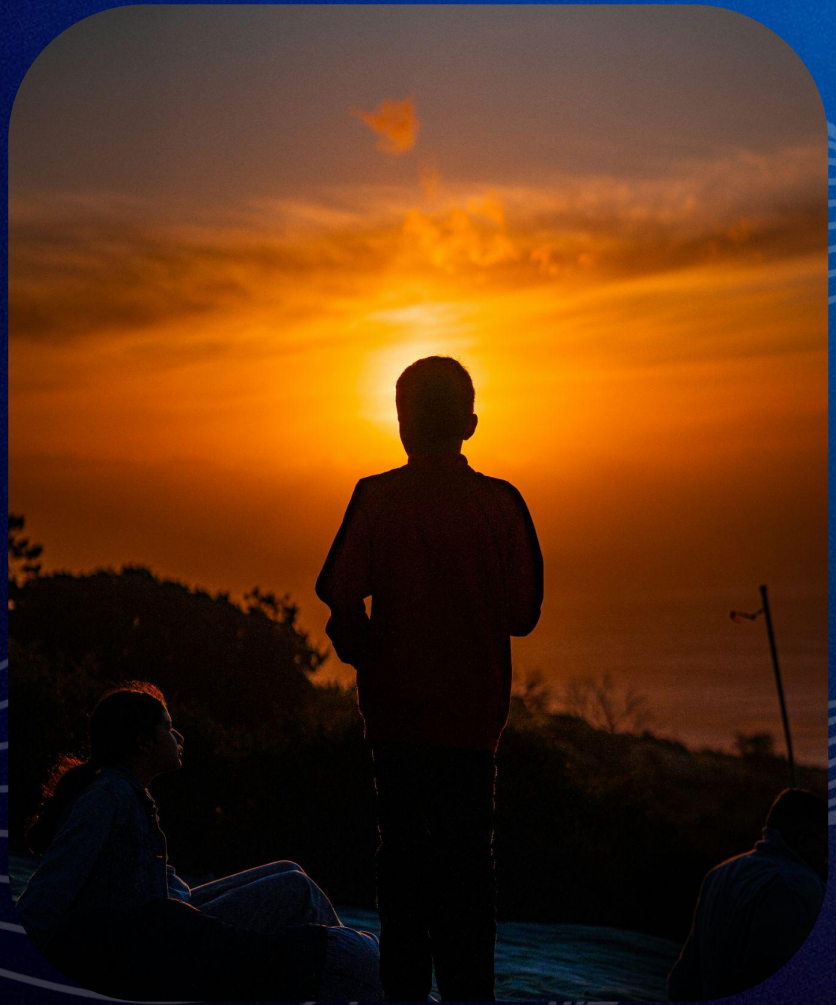
Nearest-neighbor search (KDTree)

numpy

Efficient numeric computations requests for fetching data from APIs (if needed)

Future Considerations

- Integration with emerging educational technologies
- Expansion to other sectors (healthcare, agriculture)
- Potential for global scalability in underserved regions
- Continuous AI improvements for network optimization
- Partnerships with content providers and educational platforms



The Team

Jessica Greenwalt

- 20 years of experience nudging human behavior at scale for silicon valley's tech giants
- Developed Web3 strategies, campaigns, and products for the world's biggest brands
- Co-founded a YC company that solves the world's most difficult medical cases in a fraction of the time and cost of the traditional medical system

Muhammad Hamza Hassaan

- 3rd year student of Computer Science
- Full stack Applications and ML models

Muhammad Ali

- Engineer
- Prompt Engineer
- Data Analyst

Sidratul Hayat Khan

- Prompt Pioneer
- AI Enthusiast
- Active Learner with a deep passion for artificial intelligence
- Automation
- Real-world problem-solver

Links

Lablab:
https://lablab.ai/event/ai-for-connectivity-hackathon-building-resilient-networks/lace

GitHub:
https://github.com/M-Hamza-Hassaan/Connect-Ai-Innovators