# LifeLine AI

## An ML-Powered Triage System for Crisis Zones

When every minute counts, technology can be a lifeline

CIS 508: Machine Learning in Business, MS-AIB
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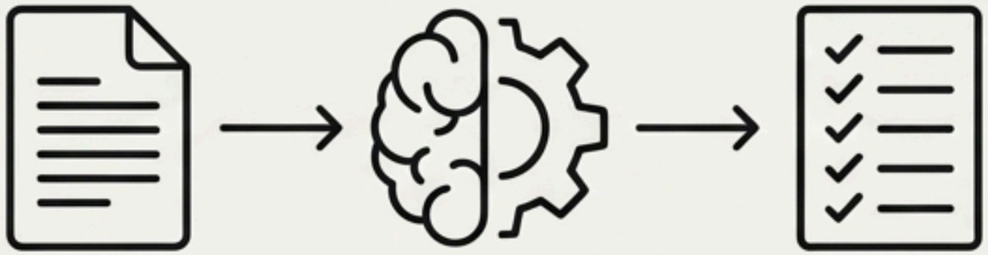
# Framing the Triage Challenge for Machine Learning

## The Analytical Task



**Task Type:** Multi-class Text Classification

**Input:** Natural language symptom descriptions from a field worker.

**Output:** A ranked prediction of one of 65 medical conditions.

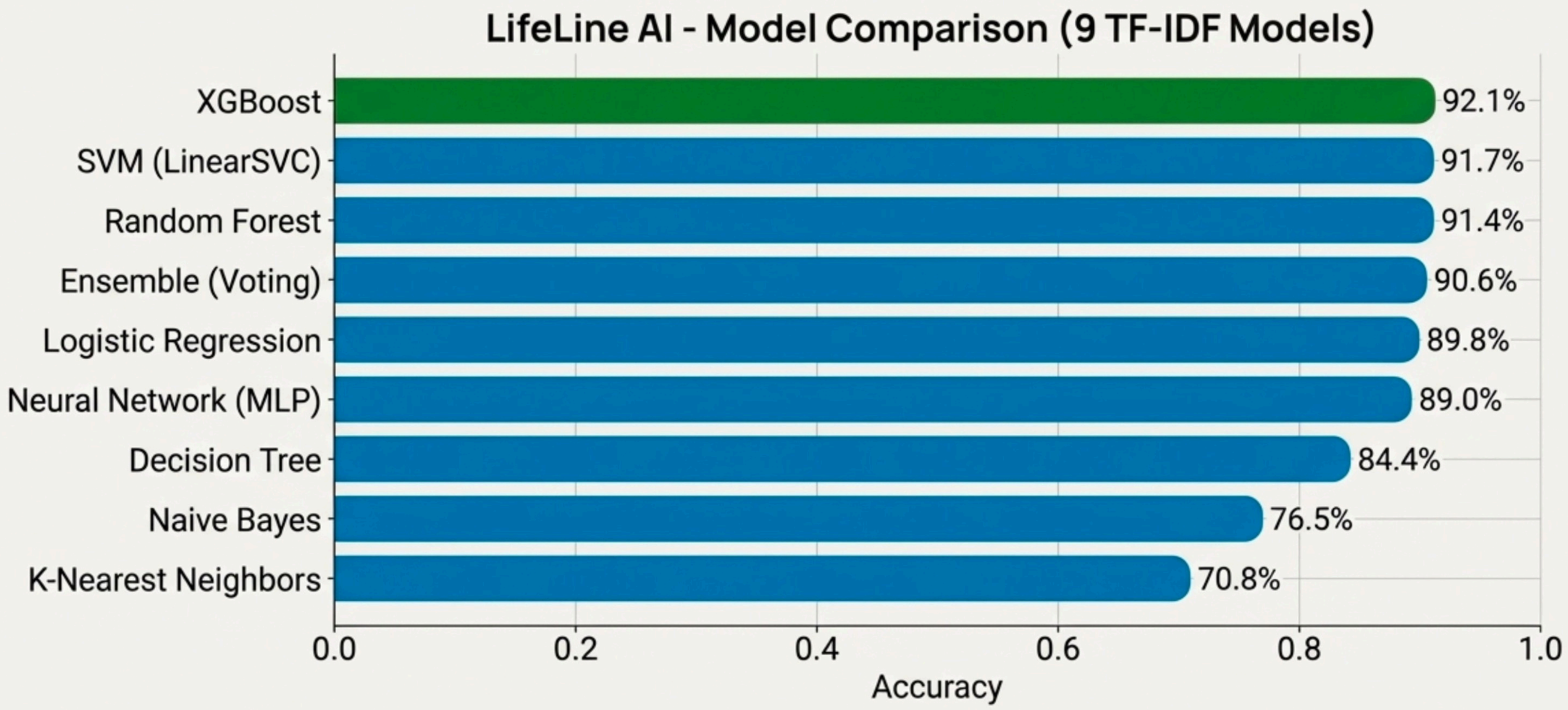
## The End Users & Business Value

### Who Benefits

NGO workers (Doctors Without Borders, Red Cross), first responders, military medics, community health workers.

### Tangible Impact

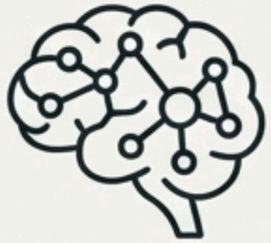
- ✓ Accelerates triage decisions.
- ✓ Reduces misdiagnosis in resource-limited settings.
- ✓ Optimizes supply chain planning.
- ✓ Ultimately, saves lives when medical experts are unavailable.


LifeLine AI - Model Comparison (9 TF-IDF Models)
XGBoost
SVM (LinearSVC)
Random Forest
Ensemble (Voting)
Logistic Regression
Neural Network (MLP)
Decision Tree
Naive Bayes
K-Nearest Neighbors
92.1%
91.7%
91.4%
90.6%
89.8%
89.0%
84.4%
76.5%
70.8%
0.0
0.2
0.4
0.6
0.8
1.0
Accuracy

# A Tool Built for the Field: Translating Features into Human Impact

| | | |
|---|---|---|
| Simple UI & Natural Language Input | → | **Usable by non-technical NGO workers** under high-stress conditions. |
| Fast, GPU-Free Inference | → | **Provides instant results** on any basic device (laptop or phone). |
| Triage Colors (Red/Yellow/Green) | → | **Enables rapid resource allocation** and prioritization of patients. |
| Supply Chain Recommendations | → | **Provides actionable logistics information**, helping teams prepare and request necessary equipment. |
| Web-Based (Streamlit) | → | **Works on any device with a browser**, no installation required. |

# The Horizon: A Strategic Roadmap for LifeLine AI



## Increase Diagnostic Power

Implement **multi-label classification** to handle patients with multiple conditions, using a larger dataset (50,000+ samples) to potentially leverage models like BioBERT.

## Improve Field Accessibility

Develop an **offline mobile application** for use in areas with no internet connectivity.

## Expand Global Reach

Add **multi-language support** to make the tool accessible to workers and patients worldwide.

## Integrate with Logistics

Create integrations with **medical supply inventory systems** for real-time supply tracking and automated requests.

# Resources & Project Integrity

## Explore the Project

### Live Application

https://lifeline-ai.streamlit.app

### GitHub Repository

https://github.com/mjeelan1/lifeline-ai

**Disclaimer**

LifeLine AI is a **decision-support tool**, not a replacement for professional medical diagnosis. It is designed to assist trained personnel in resource-limited settings. Always consult qualified healthcare providers when available.