🧠 RESUME: Risk Evaluation and Suicide Understanding Mon

📋 Project Overview

RESUME is an advanced predictive analytics tool designed to identify and assess suicide risk among healthcare workers. The project combines multiple analytical approaches to p

🔗 **Project Website:** RESUME Project Portal

🎯 Core Objectives

1. Early Risk Detection
2. Continuous Monitoring
3. Predictive Analytics
4. Evidence-Based Intervention Support

⭐ Key Features

- 🔄 Real-time risk assessment
- 📊 Multi-modal data analysis
- ⏱️ Temporal pattern recognition
- 📈 Interactive visualization
- 🔒 Secure data management

🏗️ Technical Architecture

📥 Data Collection

- 📝 Structured clinical assessments
- 📊 Psychometric measurements
- ⏱️ Temporal behavioral patterns
- 🌎 Environmental factors

🔄 Analysis Pipeline

1. 🔍 Data Preprocessing
2. ⚙️ Feature Engineering
3. ⚖️ Risk Assessment
4. 🤖 Predictive Modeling
5. 📊 Visualization

🔮 Predictive Models

1. 📈 Survival Analysis

📊 Kaplan-Meier Estimator

- Estimates probability of remaining crisis-free over time
- Non-parametric approach for time-to-event analysis
- Accounts for censored data

📉 Cox Proportional Hazards

- Analyzes impact of multiple variables on survival
- Hazard ratios quantify risk factors
- Time-dependent covariate analysis

2. 🤖 Machine Learning Models

🌳 XGBoost Classification

- Gradient boosting framework
- Features:
  - 👤 Demographic factors
  - 🏥 Clinical indicators
  - 🧠 Psychosocial variables
  - 🌍 Environmental factors
- Hyperparameter optimization
- Cross-validation methodology

3. ⚖️ Risk Scoring System

- Weighted combination of:
  - 📋 Clinical assessments
  - 📚 Historical data
  - 🔄 Real-time indicators
  - 🌍 Environmental factors

📝 Methodology

🔄 Data Processing Pipeline

1. 📥 **Data Collection**
   - 📝 Standardized assessments
   - 👨‍⚕️ Clinical observations
   - ⏱️ Temporal tracking
2. ⚙️ **Feature Engineering**
   - 📊 Temporal aggregation
   - 🎯 Risk factor computation
   - 🔄 Interaction terms
3. 🤖 **Model Training**
   - ✔️ Cross-validation
   - ⚙️ Hyperparameter optimization
   - 🔄 Model ensemble
4. 🎯 **Validation**
   - 👨‍⚕️ Clinical validation
   - 📊 Statistical testing
   - 📈 Performance metrics