ML MODEL DEPLOYMENT FRAMEWORK PATENT

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ABSTRACT

A system and method for automated deployment and optimization of machine learning models in enterprise environments, comprising a standardized framework for model validation, deployment orchestration, and performance monitoring across distributed computing environments. The invention includes proprietary algorithms for automated model health checking, dynamic resource allocation, and intelligent fallback procedures.

BACKGROUND OF THE INVENTION

[0001] Machine learning model deployment in enterprise environments presents significant challenges related to scalability, reliability, and maintenance. Existing solutions often require manual intervention and lack standardized frameworks for consistent deployment across heterogeneous computing environments.

[0002] The present invention addresses these challenges through an automated framework that standardizes the deployment process while incorporating intelligent monitoring and optimization capabilities.

DETAILED DESCRIPTION

1. System Architecture

[0003] The ML Model Deployment Framework comprises:

a) A central orchestration engine

b) Distributed deployment agents

c) Performance monitoring modules

d) Resource optimization controllers

e) Model validation subsystems

2. Deployment Process

[0004] The framework implements a multi-stage deployment process:

1. Pre-deployment Validation

- Model compatibility verification
- Resource requirement analysis
- Dependencies validation
- Security compliance checking

2. Deployment Orchestration

- Automated environment preparation
- Staged rollout procedures
- Rollback capability implementation
- Configuration management

3. Post-deployment Monitoring

- Performance metrics tracking
- Resource utilization optimization
- Automated health checks
- Anomaly detection

3. Key Innovation Claims

[0005] The invention claims the following novel elements:

1. Automated Model Health Assessment

- Real-time performance monitoring
- Predictive maintenance algorithms
- Dynamic resource allocation
- Automated recovery procedures

2. Intelligent Deployment Orchestration

- Environment-aware deployment strategies
- Automatic scaling mechanisms
- Load balancing optimization
- Cross-platform compatibility

3. Performance Optimization

- Adaptive resource allocation
- Automated performance tuning
- Intelligent caching mechanisms
- Dynamic throughput optimization

CLAIMS

A method for automated deployment of machine learning models comprising:

a) Receiving a machine learning model for deployment

b) Performing automated validation checks

c) Orchestrating deployment across distributed environments

d) Implementing automated monitoring and optimization

The method of claim 1, wherein the automated validation checks comprise:

a) Model compatibility verification

b) Resource requirement analysis

c) Security compliance validation

d) Performance benchmark testing

The method of claim 1, wherein the deployment orchestration comprises:

a) Environment preparation

b) Staged rollout procedures

c) Automated rollback capabilities

d) Configuration management

INVENTORS

Dr. Robert Martinez

Chief Innovation Officer

Summit Digital Solutions, Inc.

Michael Chang

Chief Technology Officer

Summit Digital Solutions, Inc.

ASSIGNEE

Summit Digital Solutions, Inc.

1234 Innovation Drive

Wilmington, Delaware 19801

PATENT ATTORNEY

Sarah Johnson, Esq.

Registration No. 65,432

Technology Patents LLP

Washington, DC 20006

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on: March 15, 2023

/s/ Dr. Robert Martinez

Dr. Robert Martinez

Chief Innovation Officer

Summit Digital Solutions, Inc.

/s/ Michael Chang

Michael Chang

Chief Technology Officer

Summit Digital Solutions, Inc.