PATENT APPLICATION: COGNITIVE COMPUTING ARCHITECTURE

UNITED STATES PATENT AND TRADEMARK OFFICE

Application No. 17/892,456

Applicant: Nexus Intelligent Systems, Inc.

TECHNICAL FIELD

The present invention relates to a novel cognitive computing architecture designed for predictive maintenance and intelligent system diagnostics, specifically targeting enterprise-level industrial automation and machine learning optimization.

BACKGROUND OF THE INVENTION

1 Industrial Context

Modern enterprise systems require increasingly sophisticated diagnostic and predictive capabilities to minimize operational disruptions and optimize complex technological infrastructures. Existing machine learning architectures demonstrate significant limitations in:

- Real-time adaptive learning
- Cross-domain knowledge transfer
- Contextual pattern recognition
- Predictive maintenance accuracy

2 Technical Challenges

Current cognitive computing platforms suffer from:

- High computational overhead
- Limited scalability
- Insufficient adaptive learning mechanisms
- Inadequate multi-dimensional data integration

SUMMARY OF THE INVENTION

The proposed cognitive computing architecture represents a breakthrough in intelligent system

diagnostics, providing:

- Dynamic neural network reconfiguration
- Probabilistic inference modeling
- Adaptive learning algorithms
- Distributed computational intelligence

Key Innovation Characteristics

- Modular architectural design
- Autonomous learning capabilities
- Minimal computational resource requirements
- Enhanced predictive accuracy

DETAILED DESCRIPTION

1 System Architecture

The cognitive computing architecture comprises:

- Distributed neural network nodes
- Adaptive learning algorithms
- Probabilistic inference engines
- Multi-dimensional data integration modules

2 Operational Methodology

The system implements a novel approach to:

- Continuous model refinement
- Context-aware pattern recognition
- Predictive maintenance optimization
- Real-time system diagnostics

Computational Flow

Data ingestion and preprocessing

Contextual feature extraction

Probabilistic inference generation

Adaptive model reconfiguration

Predictive maintenance recommendation

CLAIMS

1 Primary Claim

A cognitive computing system comprising:

- Distributed neural network architecture
- Adaptive learning algorithms
- Probabilistic inference mechanisms
- Autonomous diagnostic capabilities

2 Specific Technical Claims

- Method for dynamic neural network reconfiguration
- System for multi-dimensional data integration
- Apparatus for context-aware machine learning
- Process for predictive maintenance optimization

TECHNICAL SPECIFICATIONS

1 Hardware Requirements

- Distributed computing infrastructure
- High-performance neural processing units
- Scalable memory architecture
- Low-latency communication protocols

2 Software Components

- Adaptive machine learning framework
- Probabilistic inference engine
- Distributed computing middleware
- Real-time diagnostic modules

PATENT DRAWINGS

Accompanying technical illustrations demonstrate:

- System block diagram

- Computational flow chart
- Neural network configuration
- Data integration methodology

LEGAL DISCLAIMERS

1 Patent Rights

All intellectual property rights are exclusively retained by Nexus Intelligent Systems, Inc., with full protection under United States patent law.

2 Confidentiality

This document contains proprietary trade secrets and confidential technological innovations.

INVENTOR DECLARATION

I, Dr. Elena Rodriguez, Chief Executive Officer of Nexus Intelligent Systems, Inc., hereby declare that the foregoing specification represents a novel and non-obvious technological innovation.

Executed this 22nd day of January, 2024.

_

Dr. Elena Rodriguez

Chief Executive Officer

Nexus Intelligent Systems, Inc.