

AI-Based Risk Assessment Model Patent CN115678901

Patent Registration Certificate

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Patent Type: Invention Patent

Patent Title: System and Method for AI-Driven Industrial Control System Risk Assessment and Threat Detection

Patent Owner: DeepShield Systems, Inc.

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Abstract

The present invention relates to an artificial intelligence-based system and method for conducting real-time risk assessment and threat detection in industrial control systems (ICS) and operational technology (OT) environments. The invention comprises a novel deep learning architecture specifically designed to analyze patterns in industrial network traffic, system behaviors, and operational parameters to identify potential security threats and vulnerabilities.

Technical Field

This invention pertains to the field of industrial cybersecurity, specifically relating to:

Industrial control system security

Operational technology protection

SCADA network monitoring

Machine learning-based threat detection

Critical infrastructure security

Detailed Description

1. System Architecture

1 The system comprises:

- (a) A distributed sensor network for data collection from industrial control systems
- (b) A central processing unit implementing proprietary neural network algorithms

- (c) An adaptive threat detection engine
- (d) Real-time monitoring and analysis modules
- (e) Response automation components

2 The neural network architecture utilizes:

- (a) Multi-layer perceptron networks
- (b) Convolutional neural networks for pattern recognition
- (c) Recurrent neural networks for sequence analysis
- (d) Custom activation functions optimized for ICS environments

2. Core Functionalities

1 Risk Assessment Capabilities:

- (a) Continuous monitoring of system parameters
- (b) Behavioral baseline establishment
- (c) Anomaly detection and classification
- (d) Risk scoring and prioritization
- (e) Threat vector analysis

2 Threat Detection Methods:

- (a) Pattern-based analysis
- (b) Signature detection
- (c) Behavioral analysis
- (d) Protocol validation
- (e) Historical comparison

3. Implementation Methods

1 The system implements:

- (a) Distributed processing architecture
- (b) Real-time data analysis
- (c) Automated response protocols
- (d) Adaptive learning mechanisms
- (e) Secure communication channels

2 Integration Requirements:

- (a) Compatible with standard ICS protocols
- (b) Support for legacy systems
- (c) Scalable deployment options
- (d) Redundancy mechanisms
- (e) Fault tolerance capabilities

Claims

A method for artificial intelligence-based risk assessment in industrial control systems comprising:

- a) Collecting operational data from industrial control system components
- b) Processing collected data through proprietary neural network architecture
- c) Generating risk assessments based on processed data
- d) Implementing automated response protocols

The system architecture as described in Section 1, specifically comprising:

- a) Distributed sensor network
- b) Central processing unit
- c) Neural network implementation
- d) Response automation system

The risk assessment methodology as described in Section 2, including:

- a) Continuous monitoring capabilities
- b) Behavioral analysis
- c) Threat detection
- d) Response automation

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Certification

The undersigned hereby certifies that this is a true and accurate copy of Patent CN115678901 as registered with the Chinese National Intellectual Property Administration.

Executed this 12th day of March, 2023

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