Industrial Control System Protection Patent CN113456789

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Patent Title: System and Method for Multi-Layer Industrial Control System Protection Using Adaptive Neural Networks

Patent Owner

DeepShield Systems, Inc.

1750 Innovation Drive

Wilmington, Delaware 19801

United States of America

Inventors

Dr. Elena Rodriguez

James Morrison

Dr. Marcus Chen

Sarah Blackwood

Technical Field

This invention relates to the field of industrial control system (ICS) security, specifically concerning methods and systems for protecting operational technology (OT) environments using adaptive neural networks and deep learning algorithms for threat detection and mitigation in critical infrastructure environments.

Abstract

A system and method for protecting industrial control systems through multi-layered security architecture incorporating adaptive neural networks. The invention comprises a novel approach to detecting and preventing cyber threats in operational technology environments by implementing

real-time monitoring, anomaly detection, and automated response mechanisms specifically designed for industrial automation systems and SCADA networks.

Claims

A method for protecting industrial control systems, comprising:

a) Implementing a multi-layer security architecture with at least three distinct protection layers;

b) Utilizing adaptive neural networks for real-time threat detection;

c) Employing pattern recognition algorithms to identify anomalous behavior in OT networks;

d) Automatically generating and implementing response protocols based on threat classification.

The method of Claim 1, wherein the adaptive neural networks are trained using:

a) Historical operational data from industrial control systems;

b) Known threat signatures and attack patterns;

c) Normal operational baselines specific to the protected environment.

A system for implementing the method of Claim 1, comprising:

a) Network monitoring modules;

b) Neural network processing units;

c) Automated response mechanisms;

d) Secure communication channels between system components.

Technical Description

The invention implements a novel approach to industrial control system protection through:

5.1 Architecture Components

- Multi-layer security framework
- Neural network processing units
- Real-time monitoring modules
- Automated response mechanisms
- Secure communication protocols

5.2 Protection Methodology

- Continuous monitoring of OT network traffic

- Pattern recognition using adaptive neural networks
- Threat classification and categorization
- Automated response protocol generation
- System health monitoring and reporting

5.3 Implementation Requirements

- Minimum processing capabilities
- Network infrastructure requirements
- Security protocol specifications
- Integration parameters

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- Years 4-6: 8,000 annually
- Years 7-20: 12,000 annually

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