FLOOR PATTERN RECOGNITION USING COMPUTER VISION

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TECHNICAL DISCLOSURE AND INTELLECTUAL P

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Classification: CONFIDENTIAL - Level 2

Owner: NaviFloor Robotics, Inc.

1. OVERVIEW AND SCOPE

1. This document describes the proprietary computer vision technology and r

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2. The technology detailed herein encompasses both hardware configurations

2. TECHNICAL SPECIFICATIONS

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1. System Architecture

The floor pattern recognition system comprises:

(a) Multi-spectral imaging array with minimum resolution of 1280x960 pixe

(b) Depth-sensing LiDAR module operating at 905nm wavelength

(c) Real-time processing unit with dedicated tensor processing capabilities

(d) Surface texture analysis algorithms

(e) Machine learning model training infrastructure

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2. Core Technologies

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2.1. Pattern Recognition Methodology

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Hierarchical feature extraction using modified ResNet-50 architecture

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Multi-scale texture analysis with Gabor filter banks

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Real-time surface classification using proprietary neural network architecture

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Adaptive threshold determination for varying lighting conditions

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2.2. Surface Characterization

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Dynamic coefficient of friction estimation

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Material composition inference

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Wear pattern detection and analysis

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Surface irregularity mapping

3. INTELLECTUAL PROPERTY CLAIMS

1. Protected Elements

The following elements are claimed as trade secrets and/or patent-pending innovations:

(a) Adaptive neural network architecture for real-time surface classification

(b) Multi-modal sensor fusion algorithms for texture analysis

(c) Proprietary calibration methodologies for varying environmental conditio

(d) Machine learning model training protocols specific to industrial floor surfaces

(e) Error correction and validation frameworks

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2. Derivative Works

Any improvements, modifications, or derivative works based on the core technology described herein shall be owned exclusively by NaviFloor Robot Inc.

4. CONFIDENTIALITY AND USAGE RESTRICTIONS

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1. All information contained in this document is strictly confidential and con

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2. Access Limitations

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Restricted to authorized personnel with signed NDAs

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Subject to compartmentalized access controls

Requires minimum security clearance level 2

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Must be accessed through secure VDR environment only

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3. Usage Restrictions

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No reverse engineering permitted

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No unauthorized reproduction or distribution

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No public disclosure without written authorization

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No competitive analysis or benchmarking

5. IMPLEMENTATION REQUIREMENTS

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1. Hardware Requirements

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Minimum processing capability: 8 TOPS

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RAM: 16GB or higher

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Storage: 256GB SSD

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Network connectivity: Gigabit Ethernet

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2. Software Dependencies

CUDA 11.4 or higher

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TensorRT 8.0+

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OpenCV 4.5+

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Proprietary NaviFloor Runtime Environment v3.2

6. COMPLIANCE AND CERTIFICATION

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1. The technology described herein complies with:

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ISO/IEC 27001:2013 Information Security Management

IEC 61508 Functional Safety Standard

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CE marking requirements for industrial equipment

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ANSI/RIA R15.06-2012 Industrial Robot Safety

7. VERIFICATION AND VALIDATION

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1. Testing Protocols

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Automated unit testing suite

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Integration testing framework

- Performance validation metrics
- Safety compliance verification

- 2. Quality Assurance
- Continuous monitoring system
- Error logging and analysis
- Performance metrics tracking
- Regular calibration requirements

8. LEGAL NOTICES

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use, reproduction, or distribution may result in civil and criminal penalties.

9. CERTIFICATION

The undersigned hereby certifies that the information contained in this docur

is accurate and complete as of the Effective Date.

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**By:**

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## 10. DOCUMENT CONTROL

Version: 2.3

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