

AUTOMATED QUALITY ASSURANCE SYSTEM FOR FLOOR CLEANING

AUTOMATED QUALITY ASSURANCE SYSTEM

TECHNICAL SPECIFICATION AND INTELLECTUAL

NaviFloor Robotics, Inc.

Document Reference: NF-IP-2024-003

Last Updated: January 11, 2024

1. OVERVIEW AND SCOPE

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1. This document describes the proprietary Automated Quality Assurance System.

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2. The System comprises hardware and software components that enable autonomous navigation and data collection.

2. SYSTEM ARCHITECTURE

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1. Hardware Components

a) Multi-spectral imaging sensors (Model NF-MS450)

b) Advanced LiDAR array (Custom NaviFloor 4th generation)

c) Surface texture analysis probes

d) Environmental condition sensors

e) Onboard processing unit (NaviCore Pro)

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2. Software Components

- a) NaviFloor Quality Assessment Algorithm v4.2
- b) Surface Pattern Recognition Engine
- c) Real-time Analytics Module
- d) Quality Metrics Dashboard
- e) Fleet Management Integration Interface

3. PROPRIETARY TECHNOLOGY

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1. Core Technologies

The System incorporates the following proprietary technologies:

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1.1. Multi-Surface Adaptive Navigation System

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Patent No.: US 11,234,567

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Filing Date: April 15, 2019

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Status: Granted

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1.2. Dynamic Surface Quality Assessment Algorithm

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Patent Application No.: US 2023/0098765

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Filing Date: September 23, 2022

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Status: Pending

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2. Trade Secrets

The following components are maintained as trade secrets:

- a) Calibration methodologies for multi-surface detection
- b) Machine learning training datasets
- c) Quality metric correlation algorithms
- d) Environmental compensation factors

4. OPERATIONAL SPECIFICATIONS

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1. Performance Parameters

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Surface analysis speed: Up to 2,000 sq ft/hour

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Quality assessment accuracy: 99.7%

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Real-time data processing latency: <50ms

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Multi-surface recognition capability: 15 distinct surface types

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2. Environmental Operating Conditions

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Temperature range: 0°C to 45°C

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Humidity: 10% to 90% non-condensing

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Lighting conditions: 5-1000 lux

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Maximum slope gradient: 15 degrees

5. DATA MANAGEMENT AND SECURITY

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1. Data Collection

The System collects and processes:

- a) Surface texture maps
- b) Cleanliness metrics
- c) Environmental conditions
- d) Operation timestamps
- e) Quality assessment scores

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2. Security Measures

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AES-256 encryption for data at rest

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TLS 1.3 for data in transit

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Role-based access control

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Secure boot verification

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Automated security patches

6. INTEGRATION CAPABILITIES

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1. The System supports integration with:

- a) NaviFloor Fleet Management Platform
- b) Third-party building management systems
- c) Enterprise resource planning systems
- d) Quality management databases

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2. API Specifications

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RESTful API architecture

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OAuth 2.0 authentication

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JSON data format

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Rate limiting: 1000 requests/minute

7. INTELLECTUAL PROPERTY NOTICES

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1. All intellectual property rights in the System, including patents, trade secrets,

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2. This document is confidential and proprietary to NaviFloor Robotics, Inc.

8. CERTIFICATION AND COMPLIANCE

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1. The System has been certified to meet:

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ISO 9001:2015 Quality Management Systems

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IEC 61508 Functional Safety Standard

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CE Mark requirements

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UL 1740 Robot Safety Standard

DOCUMENT AUTHORIZATION

APPROVED BY:

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