NAMIC OBSTACLE DETECTION AND AVOIDANCE IN ROBOTIC FLOOR CLEANI

DYNAMIC OBSTACLE DETECTION AND AVO

PROPRIETARY AND CONFIDENTIAL TECHNOLOGY DOCUMENT

NaviFloor Robotics, Inc.

Document Reference: IP-TECH-2023-0472

1. OVERVIEW AND SCOPE

1. This document describes the proprietary technology and methodolo

2. The System comprises hardware components, software algorithms

2. TECHNICAL SPECIFICATIONS

1. **Sensor Array Configuration**

- Primary LiDAR unit: NaviSense(TM) Model NS-450i
- Secondary depth sensors: 4x TerrainMap(TM) TD-200 units
- Ultrasonic proximity sensors: 8x NaviSonic(TM) US-100 units
- Resolution: 0.5cm at 5m range
- Scanning frequency: 40Hz

2. **Processing Architecture**

Main processor: NaviCore(TM) NC-7000 Series

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Auxiliary processing units: 2x NaviEdge(TM) NE-300

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Real-time operating system: NaviOS(TM) v4.2

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Memory allocation: 8GB dedicated VRAM

3. PROPRIETARY ALGORITHMS

1. **Object Detection Framework**

The System employs proprietary algorithms for:

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Dynamic object tracking using predictive modeling

Surface classification and terrain mapping

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Path optimization with real-time adjustment

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Multi-sensor data fusion and integration

2. **NaviTrack(TM) Technology**

Protected under U.S. Patent No. 11,XXX,XXX and related internationa

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Adaptive learning algorithms for obstacle pattern recognition

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Velocity-based trajectory prediction

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Multi-surface navigation optimization

- Dynamic path recalculation protocols

4. IMPLEMENTATION METHODOLOGY

1. **System Integration**

- Hardware-software interface protocols
- Sensor calibration procedures
- Real-time data processing pipeline
- Emergency override systems

2. **Performance Parameters**

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Minimum detection range: 0.1m

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Maximum detection range: 25m

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Response latency: <10ms

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Obstacle classification accuracy: 99.7%

5. SECURITY MEASURES

1. **Data Protection**

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End-to-end encryption of sensor data

- Secure firmware update protocols
- Access control mechanisms
- Anti-tampering systems

2. **Operational Security**
- Remote monitoring capabilities
- Audit logging systems
- Failure detection and reporting
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Backup navigation protocols

6. INTELLECTUAL PROPERTY PROTECTION

1. This technology is protected by:

- U.S. Patent No. 11,XXX,XXX
- U.S. Patent No. 11,XXX,XXX
- European Patent No. EP3XXXXXX
- PCT Application No. PCT/US2023/XXXXX

2. Additional IP Protection:

Registered trademarks for NaviTrack(TM), NaviSense(TM), and relate

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Copyright protection for software implementations

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Trade secret protection for proprietary algorithms

7. CONFIDENTIALITY AND USE RESTRICTIONS

1. This document contains confidential and proprietary information of

2. Access to this information is restricted to authorized personnel who

8. CERTIFICATION AND COMPLIANCE

1. The System has been certified to meet:

- ISO/IEC 60XXX Safety Standards
- CE Mark requirements
- UL certification standards
- RoHS compliance requirements

9. DOCUMENT CONTROL

Document Version: 3.2

Last Updated: December 15, 2023

Approved By: Dr. Elena Kovacs, Chief Research Officer

10. LEGAL NOTICE

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