PATH PLANNING OPTIMIZATION FOR AUTONOMOUS FLOOR MAINTENANCE

PATH PLANNING OPTIMIZATION FOR AUT

PROPRIETARY AND CONFIDENTIAL

NaviFloor Robotics, Inc.

Last Updated: January 11, 2024

1. OVERVIEW AND SCOPE

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1. This document describes the proprietary path planning optimization algori

2. The Path Planning System encompasses the complete technological frame

2. TECHNICAL SPECIFICATIONS

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1. Core Components

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Dynamic Terrain Mapping Module (DTM-2000)

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Adaptive Route Generation Algorithm (ARGA v4.2)

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Multi-Surface Classification System (MSC-23)

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Real-time Path Adjustment Protocol (RPAP)

2. Key Features

(a) Multi-level surface detection and classification

(b) Real-time obstacle avoidance with predictive modeling

(c) Energy-optimized route planning

(d) Fleet coordination and traffic management

(e) Machine learning-based performance optimization

3. INTELLECTUAL PROPERTY PROTECTION

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1. Patent Protection

The Path Planning System is protected under the following:

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U.S. Patent No. 11,789,XXX ("Adaptive Navigation System for Autonomou

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U.S. Patent Application No. 17/XXX,XXX ("Method for Multi-Surface Clas

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PCT Application No. PCT/US2023/XXXXX

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2. Trade Secrets

The following components are maintained as trade secrets:

(a) Surface friction coefficient calculation methods

(b) Energy consumption optimization algorithms

(c) Fleet coordination protocols

(d) Machine learning training datasets

4. IMPLEMENTATION SPECIFICATIONS

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1. System Requirements

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Minimum processing power: 4.2 GHz quad-core processor

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RAM: 16GB DDR4

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Storage: 256GB SSD

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Sensor array: NaviFloor LiDAR Model NF-L2024 or higher

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Operating System: NaviFloor OS v3.5 or higher

2. Performance Metrics

- Path optimization completion time: <500ms
- Obstacle detection accuracy: 99.98%
- Surface classification accuracy: 99.95%
- Maximum supported fleet size: 50 units
- Minimum turning radius: 0.75m

5. SECURITY PROTOCOLS

1. Data Protection

(a) All path planning data is encrypted using AES-256 encryption

(b) Secure boot verification system

(c) Encrypted communication channels between units

(d) Regular security audits and penetration testing

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2. Access Controls

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Role-based access management

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Multi-factor authentication for system modifications

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Audit logging of all system access and changes

6. PRŌPRIETARY NOTICES

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1. All components of the Path Planning System, including but not limited to

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2. Any unauthorized use, reproduction, or distribution is strictly prohibited a

7. MAINTENANCE AND UPDATES

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1. Regular system updates are provided through the NaviFloor Update Serve

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2. Critical security patches are automatically deployed

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3. Performance optimization updates are released quarterly

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4. System logs are retained for 90 days

8. COMPLIANCE AND CERTIFICATION

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1. The Path Planning System complies with:

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ISO/TS 15066:2016 (Robots and robotic devices)

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IEC 61508 (Functional Safety)

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CE Marking requirements

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UL 3100 certification for automated guided vehicles

9. CONFIDENTIALITY

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1. This document contains confidential and proprietary information of NaviF

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2. Distribution of this document is restricted to authorized personnel only an

AUTHENTICATION

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