ZONE-BASED COVERAGE PLANNING ALGORITHM

ZONE-BASED COVERAGE PLANNING ALGO

PROPRIETARY & CONFIDENTIAL DOCUMENTAT

NaviFloor Robotics, Inc.

Delaware Corporation

Document Version: 3.2

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1. ALGORITHM OVERVIEW AND OWNERSHIP

1 This document describes the proprietary Zone-Based Coverage Planning A

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2 The Algorithm and all associated intellectual property rights are wholly ow

2. TECHNICAL SPECIFICATIONS

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1 Core Components

a) Dynamic zone segmentation engine

b) Multi-surface terrain classification system

c) Adaptive path optimization module

d) Real-time coverage verification system

e) Collision avoidance integration framework

2 Primary Functions

The Algorithm performs the following core functions:

a) Autonomous subdivision of operational spaces into optimal coverage zone

b) Real-time surface characteristic analysis and classification

c) Dynamic route planning with multi-robot coordination

d) Continuous coverage verification and gap detection

e) Adaptive speed and pattern optimization based on surface conditions

3. IMPLEMENTATION METHODOLOGY

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1 Zone Classification

The Algorithm employs proprietary methods for:

a) Surface texture analysis using LiDAR point cloud data

b) Dynamic obstacle identification and classification

c) Zone priority assignment based on operational parameters

d) Real-time zone boundary adjustment

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2 Coverage Planning

The Algorithm utilizes:

a) Recursive pattern generation for optimal coverage

b) Multi-robot task allocation and coordination

c) Dynamic path adjustment based on real-time feedback

d) Energy optimization through intelligent route planning

4. INTELLECTUAL PROPERTY PROTECTION

1 Patent Protection

U.S. Patent Application No. 17/234,567 filed April 15, 2021

Title: "System and Method for Autonomous Zone-Based Coverage Planning for Robots"

Status: Pending

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2 Trade Secret Protection

The following components are maintained as trade secrets:

a) Surface classification algorithms

b) Dynamic zone optimization formulas

c) Robot coordination protocols

d) Energy efficiency calculations

5. USAGE RESTRICTIONS

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1 The Algorithm shall only be used in accordance with:

a) NaviFloor's internal operating procedures

b) Applicable licensing agreements

c) Confidentiality obligations

d) Security protocols

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2 Unauthorized use, reproduction, or disclosure is strictly prohibited and may

6. SECURITY MEASURES

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1 The Algorithm is protected by:

a) Multi-factor authentication systems

b) Encrypted storage and transmission

c) Access logging and monitoring

d) Regular security audits

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2 All access must be documented and approved by the Chief Technology Off

7. VERSION CONTROL

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1 The Algorithm is subject to:

a) Quarterly review and updates

b) Change management procedures

c) Documentation of all modifications

d) Version archiving

8. COMPLIANCE AND CERTIFICATION

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1 The Algorithm complies with:

a) ISO/IEC 27001:2013 Information Security Management

b) ANSI/RIA R15.06-2012 Industrial Robot Safety

c) CE Marking requirements for robotics systems

d) NIST Framework for Improving Critical Infrastructure Cybersecurity

9. CONFIDENTIALITY

1 This document contains confidential and proprietary information of NaviFl

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2 Distribution of this document is restricted to authorized personnel only and

AUTHENTICATION

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DOCUMENT CONTROL

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