

LIDAR-BASED FLOOR TEXTURE ANALYSIS METHOD

LIDAR-BASED FLOOR TEXTURE ANALYSIS

Patent Application Technical Description and Rights Assignment

CONFIDENTIAL AND PROPRIETARY

NaviFloor Robotics, Inc.

Filed: March 15, 2023

Internal Reference: NFR-PAT-2023-0037

1. TECHNICAL FIELD

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1. This document describes a novel method and system for real-time floor texture analysis.

2. BACKGROUND

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1. This invention relates to NaviFloor Robotics' proprietary terrain-mapping technology.

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2. The described method enables real-time analysis of floor textures, coefficients of friction, and slip resistance.

3. TECHNICAL DESCRIPTION

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1. System Components

a) High-frequency LiDAR emitter array (Model NFR-L350)

- b) Multi-channel signal processing unit
- c) Neural network-based texture classification system
- d) Real-time surface mapping processor

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2. Signal Processing Method

The system employs a novel dual-frequency LiDAR emission pattern that en

- a) Primary surface depth mapping at 905nm
- b) Secondary texture analysis at 1550nm
- c) Cross-correlation of return signals for enhanced accuracy
- d) Real-time surface characteristic computation

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3. Algorithm Architecture

The proprietary algorithm processes LiDAR returns through:

- a) Initial signal decomposition
- b) Texture pattern recognition
- c) Surface classification
- d) Friction coefficient estimation
- e) Real-time navigation adjustment

4. INTELLECTUAL PROPERTY RIGHTS

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1. Ownership

All intellectual property rights, including but not limited to patents, trade secrets, and derivative works related to the described method are the exclusive property of NaviFloor Robotics, Inc.

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2. Assignment

The inventors hereby irrevocably assign all rights, title, and interest in this invention to NaviFloor Robotics, Inc., including:

- a) Right to file patent applications worldwide
- b) Right to license the technology
- c) Right to enforce related intellectual property rights
- d) Right to collect royalties and other compensation

5. CONFIDENTIALITY

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1. This document contains confidential and proprietary information of NaviF

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2. Recipients are bound by existing confidentiality agreements and must mai

6. INVENTORS

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1. Primary Inventors:

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Dr. Marcus Depth, CTO

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Dr. Elena Kovacs, Chief Research Officer

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Dr. James Zhang, Senior Research Engineer

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2. Contributing Engineers:

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Robert Martinez, Principal Software Engineer

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Dr. Sarah Chen, Technical Advisor

7. IMPLEMENTATION SPECIFICATIONS

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1. Hardware Requirements

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Minimum LiDAR resolution: 0.1mm at 5m range

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Processing capability: 500,000 points per second

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Maximum latency: 5ms

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2. Software Integration

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Compatible with NaviFloor Core Platform v4.2+

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Requires NaviFloor Surface Analysis Module v2.1

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Real-time data processing capabilities

8. CERTIFICATION

The undersigned hereby certify that:

- a) This invention was developed during employment with NaviFloor Robotics
- b) All information provided is accurate and complete
- c) No known prior art conflicts exist

d) All ingentors have been properly identified

9. EXECUTION

IN WITNESS WHEREOF, the undersigned have executed this document as first written above.

Dr. Marcus Depth

Chief Technology Officer

NaviFloor Robotics, Inc.

Date: March 15, 2023

Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.

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Chief Financial Officer

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