

EDGE DETECTION ALGORITHM FOR FLOOR TRANSITION ZONES

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Technical Documentation and IP Rights Declaration

NaviFloor Robotics, Inc.

Document ID: IP-ALGO-2023-114

Version: 2.1

Last Updated: December 15, 2023

1. PROPRIETARY NOTICE AND CONFIDENTIALITY

This document contains proprietary and confidential information of NaviFloor

Robotics, Inc. ("NaviFloor"), a Delaware corporation. The algorithms, methodologies, and implementations described herein are protected under U.S. Patent Application No. 17/892,445 and related international filings. All rights reserved.

2. ALGORITHM OVERVIEW

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1. The Edge Detection Algorithm for Floor Transition Zones ("EDAFTZ") consists of the following steps:

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2. Primary Components:

a) LiDAR-based surface texture analysis

b) Depth-sensing differential mapping

c) Real-time terrain classification

d) Adaptive navigation path planning

3. TECHNICAL SPECIFICATIONS

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1. Core Algorithm Architecture:

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Input Layer: Multi-modal sensor fusion incorporating LiDAR point cloud data

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Processing Layer: Neural network architecture with 8 hidden layers

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Output Layer: Binary classification matrix (32x32)

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2. Performance Parameters:

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Detection Accuracy: 99.7% under standard lighting conditions

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Processing Latency: <12ms on NaviFloor's standard hardware configuration

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False Positive Rate: <0.03% in validated production environments

4. IMPLEMENTATION REQUIREMENTS

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1. Hardware Dependencies:

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Minimum Processing Unit: NaviFloor NPU-2023 or equivalent

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Sensor Requirements: NaviFloor LiDAR Array Model LA-450 or higher

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Memory Allocation: 4GB dedicated VRAM

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2. Software Dependencies:

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NaviFloor Core Framework v4.2 or higher

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CUDA 11.4 or compatible acceleration libraries

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Real-time Operating System: NaviOS 2.3 or higher

5. INTELLECTUAL PROPERTY RIGHTS

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1. Ownership Declaration:

NaviFloor Robotics, Inc. maintains exclusive ownership of all intellectual property rights related to EDAFTZ, including but not limited to:

- a) Source code implementations
- b) Training datasets
- c) Neural network architectures
- d) Deployment methodologies
- e) Associated documentation

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2. Protected Components:

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Base algorithm architecture

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Optimization techniques

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Training methodologies

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Implementation specifications

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Performance metrics

6. USAGE RESTRICTIONS

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1. This algorithm may only be implemented on NaviFloor-authorized hardware

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2. Any modification, reverse engineering, or unauthorized implementation is

7. VALIDATION AND CERTIFICATION

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1. Testing Protocol:

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Environmental conditions: -10°C to 45°C

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Humidity range: 10% to 95% non-condensing

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Surface types: 12 standard industrial floor materials

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Transition scenarios: 144 validated combinations

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2. Certification Status:

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ISO/IEC 27001:2013 compliance verified

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UL 3100 certification for robotics applications

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CE marking requirements satisfied

8. VERSION CONTROL

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1. Current Version: 2.1

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2. Release Date: December 15, 2023

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3. Previous Versions: 2.0 (June 2023), 1.2 (March 2023), 1.1 (December 2022)

9. LEGAL NOTICES

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1. This document is protected under applicable intellectual property laws and

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10. AUTHENTICATION

IN WITNESS WHEREOF, this document has been authenticated by the und
authorized representatives of NaviFloor Robotics, Inc.

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Dr. Elena Kovacs

Chief Research Officer

Date: December 15, 2023

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Chief Technology Officer

Date: December 15, 2023

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