

# FLOOR PLAN LEARNING AND MEMORY SYSTEM

## FLOOR PLAN LEARNING AND MEMORY SYSTEM

### TECHNICAL SPECIFICATION AND INTELLECTUAL PROPERTY DOCUMENT

*NaviFloor Robotics, Inc.*

*Document Reference: IP-FP-2023-142*

*Last Updated: December 15, 2023*

## 1. SYSTEM OVERVIEW

1. This document describes the proprietary Floor Plan Learning and Memory System.

2. The FPLMS represents a core intellectual property asset of the Corporation.

## 2. TECHNICAL ARCHITECTURE

### 1. \*\*Core Components\*\*

-

Multi-layer terrain mapping engine

-

Dynamic obstacle recognition system

-

Real-time path optimization algorithm

-

Distributed spatial memory network

-

Cross-platform integration framework

## 2. **Data Processing Pipeline**

The system employs a proprietary three-stage processing architecture:

- (a) Raw sensor data acquisition via LiDAR and depth sensors
- (b) Environmental feature extraction and classification
- (c) Spatial relationship mapping and memory formation

## 3. **PROPRIETARY ALGORITHMS**

### 1. **TerrainMap(TM) Processing**

-

Adaptive surface recognition algorithm

-

Multi-resolution grid mapping

-

Dynamic obstacle classification

-

Real-time update frequency: 60Hz

-

Accuracy tolerance: +/- 2.5mm

## 2. **\*\*Memory Formation Protocol\*\***

-

Hierarchical spatial memory structure

-

Temporal pattern recognition

-

Cross-reference validation system

-

Delta-based update mechanism

## 4. IMPLEMENTATION SPECIFICATIONS

### 1. \*\*Hardware Requirements\*\*

-

Minimum processor: ARM Cortex-A78 or equivalent

-

Required memory: 8GB RAM

-

Storage: 256GB NVMe

-

Sensor array: NaviFloor Standard Configuration v3.2

### 2. \*\*Software Integration\*\*

-

Operating System: NaviOS 4.5 or higher

- - 5 -

API Version: 2.3.1

-

Database: PostgreSQL 14.0 with PostGIS extensions

-

Network Protocol: NaviNet Secure v2.1

## **5. INTELLECTUAL PROPERTY PROTECTION**

### **1. \*\*Patent Coverage\*\***

The FPLMS is protected under the following patents:

-

U.S. Patent No. 11,487,XXX

-

European Patent No. EP3,XXX,XXX

- - 6 -

Japanese Patent No. JP2023-XXXXXX

-

Chinese Patent No. CN112XXXXX

## 2. **\*\*Trade Secret Protection\*\***

Critical algorithms and implementation details are maintained as trade secrets under Company's IP Security Protocol (Doc. Ref: IP-SEC-2023-089).

# 6. LICENSING AND USAGE

## 1. **\*\*Internal Use\*\***

This system shall be used exclusively within Company's products and services unless explicitly licensed to third parties through written agreement.

## 2. **\*\*Third-Party Integration\*\***

Integration with third-party systems requires:

- (a) Written authorization from Company's CTO
- (b) Execution of Company's standard integration agreement
- (c) Implementation of required security protocols

## **7. SECURITY MEASURES**

### **1. \*\*Data Protection\*\***

-

256-bit AES encryption for stored floor plans

-

Secure boot verification

-

Encrypted sensor data transmission



- - 8 -

Access control through NaviFloor Security Framework

## 2. **\*\*Authentication Protocol\*\***

-

Multi-factor authentication for system access

-

Role-based access control

-

Audit logging of all system interactions

## **8. COMPLIANCE AND CERTIFICATION**

1. The FPLMS has been certified compliant with:

-

ISO/IEC 27001:2022

-

IEC 61508 SIL 2

-

CE Marking requirements

-

UL 1740 Standard for Robot Safety

## **9. CONFIDENTIALITY**

1. This document contains confidential and proprietary information of
2. Distribution limited to authorized personnel under NDA (Reference:

## **10. DOCUMENT CONTROL**

Version: 3.2.1

Document Owner: Chief Technology Office

Last Review Date: December 15, 2023

Next Review Date: June 15, 2024

## **AUTHORIZATION**

APPROVED BY:

Marcus Depth

Chief Technology Officer

NaviFloor Robotics, Inc.

Date: December 15, 2023

- 11 -

Dr. Elena Kovacs

Chief Research Officer

NaviFloor Robotics, Inc.

Date: December 15, 2023

