MULTI-ROBOT TASK ALLOCATION AND COORDINATION SYSTEM

MULTI-ROBOT TASK ALLOCATION AND CO

TECHNICAL SPECIFICATION AND INTELLECTUA

PROPRIETARY AND CONFIDENTIAL

NaviFloor Robotics, Inc.

Last Updated: January 11, 2024

Document ID: MRTACS-2024-001

1. SYSTEM OVERVIEW

1. This document describes the proprietary Multi-Robot Task Allocation and

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2. MRTACS encompasses the Company's proprietary algorithms, software a

2. TECHNICAL ARCHITECTURE

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1. Core Components

a) Central Task Allocation Engine (TAE-2000)

b) Distributed Robot Control Nodes (RCN-Series)

c) Environmental Mapping Subsystem (EMS)

d) Real-time Communication Protocol Stack (RTCP-NF)

2. System Architecture

The MRTACS implements a hierarchical control structure utilizing:

a) Layer 1: Strategic Planning Layer

b) Layer 2: Tactical Coordination Layer

c) Layer 3: Operational Execution Layer

d) Layer 4: Safety and Compliance Layer

3. PROPRIETARY ALGORITHMS

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1. Task Allocation Algorithm

Protected under U.S. Patent No. 11,XXX,XXX and related international filin

a) Dynamic workload distribution

b) Multi-objective optimization

c) Real-time constraint handling

d) Adaptive resource allocation

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2. Path Planning and Navigation

Protected under U.S. Patent No. 11,YYY,YYY:

a) Multi-surface terrain mapping

b) Obstacle avoidance protocols

c) Dynamic route optimization

d) Collision prediction and prevention

4. INTELLECTUAL PROPERTY PROTECTION

1. Patent Portfolio

The MRTACS is protected by:

a) 12 issued U.S. patents

b) 8 pending U.S. patent applications

c) 15 international patent applications under PCT

d) Related continuation applications

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2. Trade Secrets

The following components are maintained as trade secrets:

a) Proprietary calibration methodologies

b) Advanced sensor fusion algorithms

c) Machine learning training datasets

d) System optimization parameters

5. IMPLEMENTATION SPECIFICATIONS

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1. Hardware Requirements

a) Minimum processing capabilities

b) Network infrastructure requirements

c) Sensor integration specifications

d) Power management systems

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2. Software Dependencies

a) Operating system requirements

b) Database management systems

c) Communication protocols

d) Security frameworks

6. SECURITY MEASURES

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1. Data Protection

a) End-to-end encryption protocols

b) Secure communication channels

c) Access control mechanisms

d) Audit logging systems

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2. Physical Security

a) Hardware security modules

b) Tamper detection systems

c) Secure boot procedures

d) Environmental monitoring

7. COMPLIANCE AND CERTIFICATION

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1. Industry Standards

MRTACS complies with:

a) ISO/TS 15066:2016

b) IEC 61508

c) ANSI/RIA R15.06-2012

d) EN ISO 13849-1:2015

2. Regulatory Compliance

System maintains compliance with:

a) OSHA requirements

b) CE marking standards

c) UL certification requirements

d) Regional safety regulations

8. CONFIDENTIALITY AND OWNERSHIP

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1. All information contained herein is the exclusive property of NaviFloor Re

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2. No part of this system may be reproduced, distributed, or transmitted in an

9. EXECUTION

IN WITNESS WHEREOF, this document has been executed by the duly aut
representatives of NaviFloor Robotics, Inc.

NAVIFLOOR ROBOTICS, INC.

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