COLD ENVIRONMENT DATA PROCESSING PATENT

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UNITED STATES PATENT APPLICATION NO. 16/78

Filed: March 15, 2022

TITLE OF INVENTION:

System and Method for Low-Temperature Data Processing in Autono

Robots

APPLICANT:

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INVENTORS:

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ABSTRACT

A system and method for processing data in extreme cold environmen
temperature-hardened computing architecture. The invention compris
specialized processor configuration, thermal management system, an
handling protocols that enable reliable computation in sub-zero enviro
down to -40 C. The system utilizes proprietary BlueCore(TM) technolo
maintain processing capabilities in cold storage and industrial freezer
environments without performance degradation.

BACKGROUND OF INVENTION

[001] Autonomous mobile robots operating in cold storage environmen

significant challenges related to data processing reliability. Traditional

computing systems experience performance degradation and compor

exposed to sustained low temperatures.

[002] Existing solutions rely on expensive heating elements or enviror

isolation, resulting in reduced efficiency and increased power consum

SUMMARY OF INVENTION

[003] The present invention provides a novel approach to cold enviror

processing through:

a) Temperature-resistant processor architecture

b) Adaptive clock speed management

c) Cold-optimized memory systems

d) Thermal energy recycling

e) Distributed computing load balancing

DETAILED DESCRIPTION

[004] The system comprises:

Processor Configuration

[005] A modified ARM-based processor architecture incorporating:

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Silicon substrate optimized for sub-zero operation

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Variable voltage control system

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Thermal monitoring array

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Redundant processing cores

Thermal Management

[006] Proprietary BlueCore(TM) technology featuring:

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Passive heat distribution network

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Phase-change material heat sinks

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Microfluidic cooling channels

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Temperature-triggered power management

Data Handling Protocols

[007] Enhanced data processing algorithms including:

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Cold-environment error correction

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Dynamic resource allocation

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Predictive thermal modeling

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Fail-safe data backup systems

CLAIMS

A system for processing data in cold environments comprising:

a) A temperature-hardened processor assembly

b) Thermal management subsystem

c) Adaptive processing algorithms

d) Environmental monitoring sensors

The system of claim 1, wherein the processor assembly operates at te

The system of claim 1, wherein the thermal management subsystem u

A method for maintaining data processing capabilities in sub-zero env

a) Monitoring ambient and component temperatures

b) Adjusting processing loads based on thermal conditions

c) Implementing error correction protocols

d) Managing power distribution

DRAWINGS

[008] Figure 1: System Architecture Diagram

[009] Figure 2: Thermal Management Flow

[010] Figure 3: Data Processing Sequence

[011] Figure 4: Component Layout

DECLARATION

I hereby declare that:

I am the original inventor of the subject matter which is claimed and fo

I have reviewed and understand the contents of this application;

I acknowledge the duty to disclose information material to patentability

SIGNATURES

Executed on this 15th day of March, 2022

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