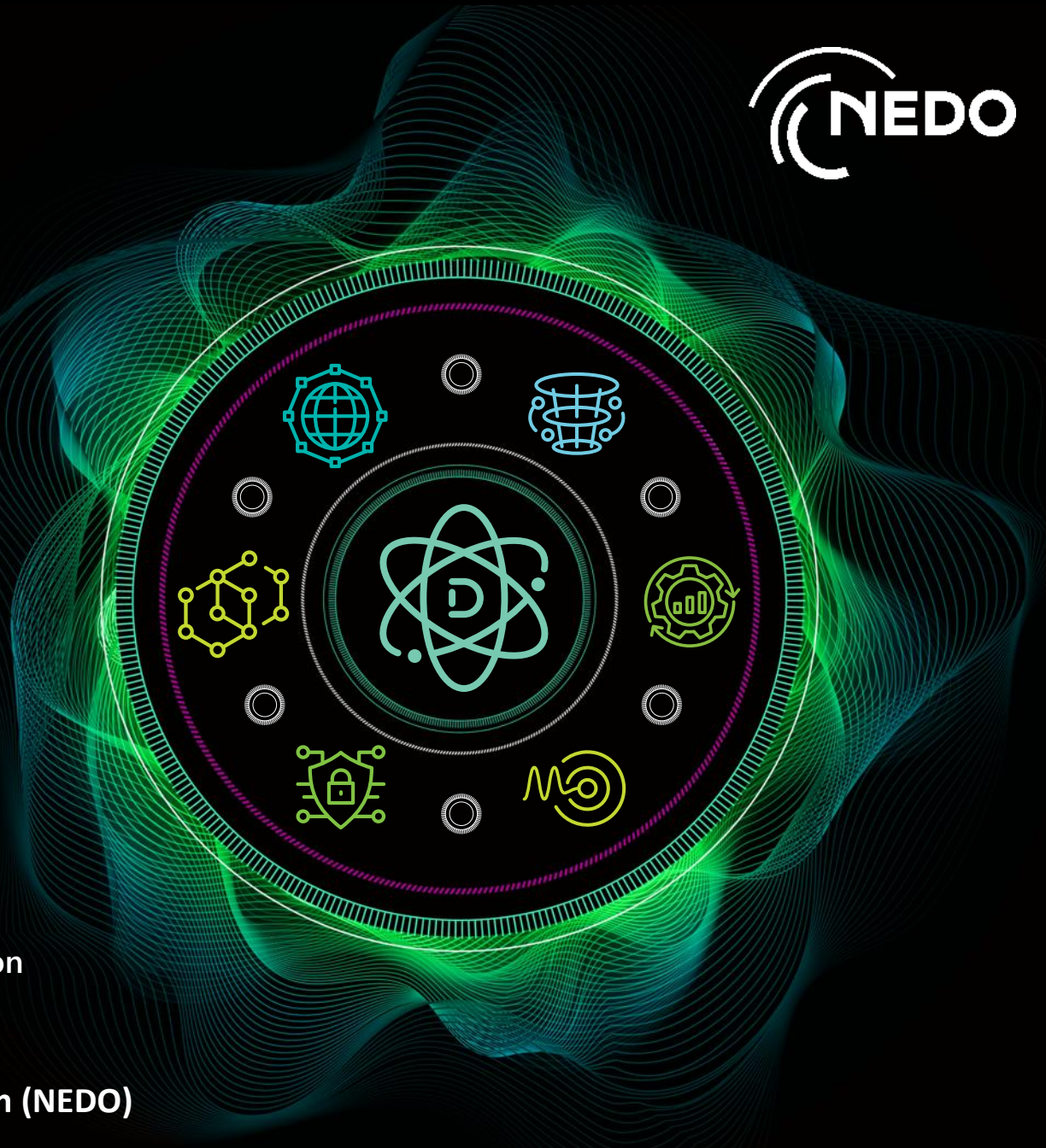
Quantum Computing Use Cases

Flying car (drone) emergency landing guidance system

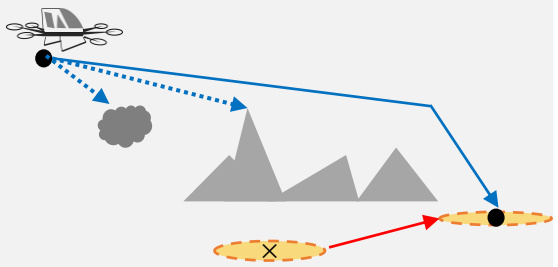


Combinatorial Optimization Problem

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New Energy and Industrial Technology Development Organization (NEDO)

【Hypothesis formulation】Flying car (drone) emergency landing guidance system



Emergency Landing Guidance Concept

Use Case Overview	Real-time determination of emergency landing sites and routes for flying cars (drones)
Issues to be addressed and their effects	Prevent crashes in emergency situations, enable rapid occupant evacuation, and reduce congestion by distributing emergency landing sites.
Contributions of quantum technology	Quantum (inspired) computing enables the rapid solution of combinatorial optimization problems with vast numbers of possible combinations.

Expected realization period	2030~2040
Industry classification	Transportation industry
Related QRAMI layers	Business: "Avoiding traffic congestion and optimizing transportation routes"
Related quantum technologies	Quantum annealing (Ising machine)

Novelty	Low
Difficulty of achievement	Mid
Social contribution level	Mid
Market size	Low

Details

Flying car (drone) emergency landing guidance system

Key Challenges

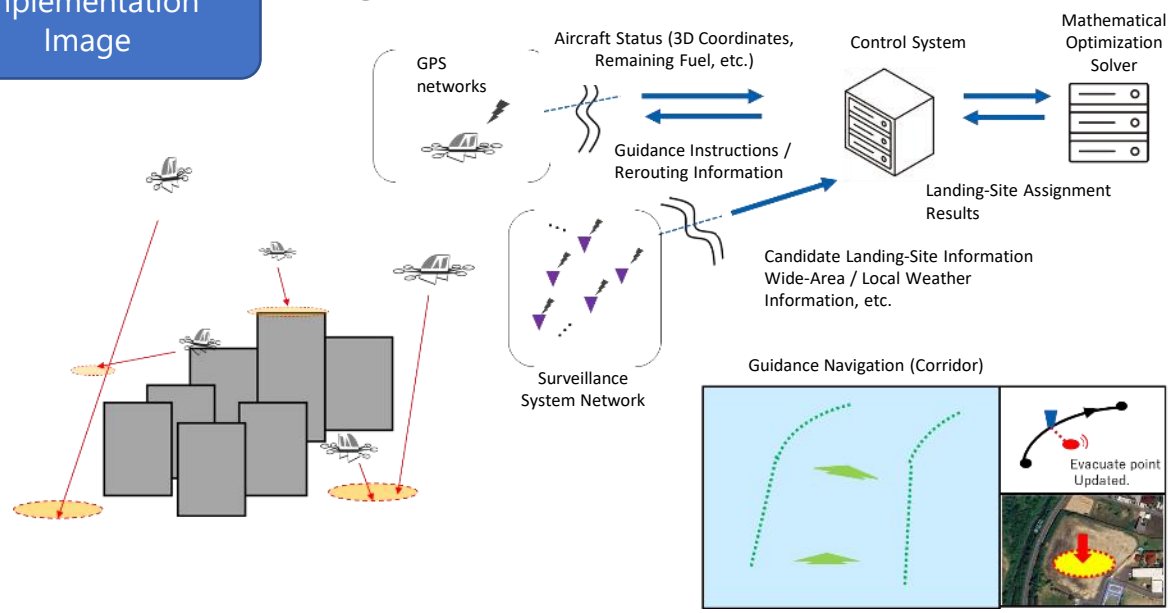
- Real-Time Optimization
- Prevention of Vehicle Crashes

Overview of the Use Case

During the operational phase of flying cars as transport vehicles, real-time data—including vehicle location, status, airflow conditions, and obstacle information—is used to determine emergency landing destinations and routes for each aircraft. The system guides vehicles safely during emergencies, distributes landing sites to avoid congestion, and reduces crash risks through safe flight and landing operations, helping improve public acceptance of flights over residential areas.

Implementation Image

Target Realization Date: : 2030-40



Expected Benefits

- Minimize passenger burden and facilitate rapid evacuation
- Reduce congestion at landing sites to support smooth redeployment and operational continuity (service recovery)
- Accelerate the broader adoption of flying cars as a transportation solution

Action Plan

QRAMI	Action
Business	Congestion Avoidance and Route Optimization
Function	Emergency Landing Guidance System
Information	Know-how for formulating disaster-response operational requirements and constraints as QUBO problems
Integration	Small Aircraft Real-Time Simulation
Asset	Quantum-Inspired Computer

More use cases are available on our website. We invite you to explore them.
https://www.quantum-computing-use-cases.nedo.go.jp/english/

More Use Cases

New Energy and Industrial Technology Development Organization (NEDO)
AI and Robotics Department (e-mail: quantum_ai@ml.nedo.go.jp)

This collection of use cases was obtained as a result of the work commissioned by the New Energy and Industrial Technology Development Organization (NEDO) "Cyber-Physical Development Business of Quantum/Classical Hybrid Technology/Study of Use Case of Quantum Technology" and the “Post-5G Information and Communications System Infrastructure Reinforcement R & D Project (Quantum Industrialization)/Comprehensive Study for Promoting the Industrialization of Quantum Computers ”.