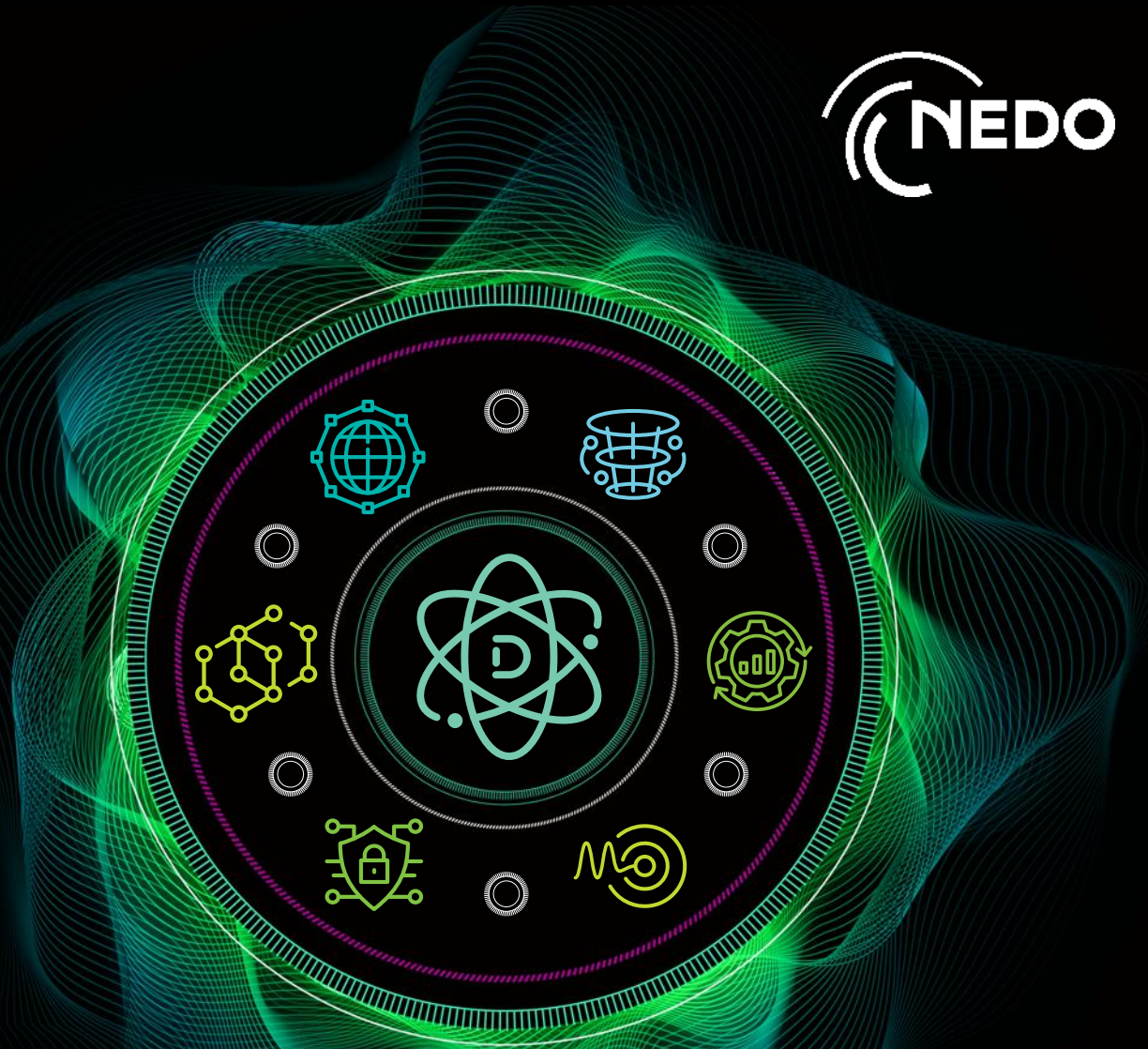
Quantum Computing Use Cases

Feature selection for machine learning using FMQA

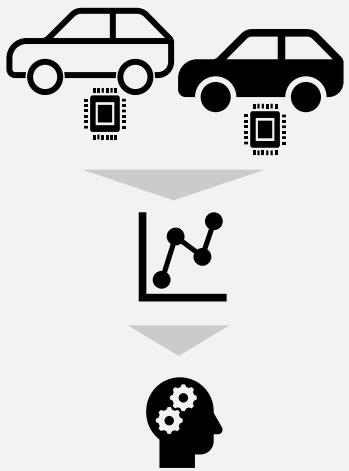


Combinatorial Optimization Problem

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New Energy and Industrial Technology Development Organization (NEDO)

【Validated】Feature selection for machine learning using FMQA



Machine Learning Feature Extraction Process

Use Case Overview	The method performs feature selection optimization to enhance the prediction accuracy of resulting machine learning model of engine test duration
Issues to be addressed and their effects	FMQA automatically selects features from data, reducing both the dependence on individual expertise and the effort required for feature selection
Contributions of quantum technology	Faster and more comprehensive feature selection than conventional approaches is expected to improve model accuracy

Expected realization period	2030
Industry classification	Manufacturing Industry
Related QRAMI layers	Information: "Sensor data, FMQA"
Related quantum technologies	Quantum annealing (Ising machine)

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

Details

Feature selection for machine learning using FMQA

Key Challenges

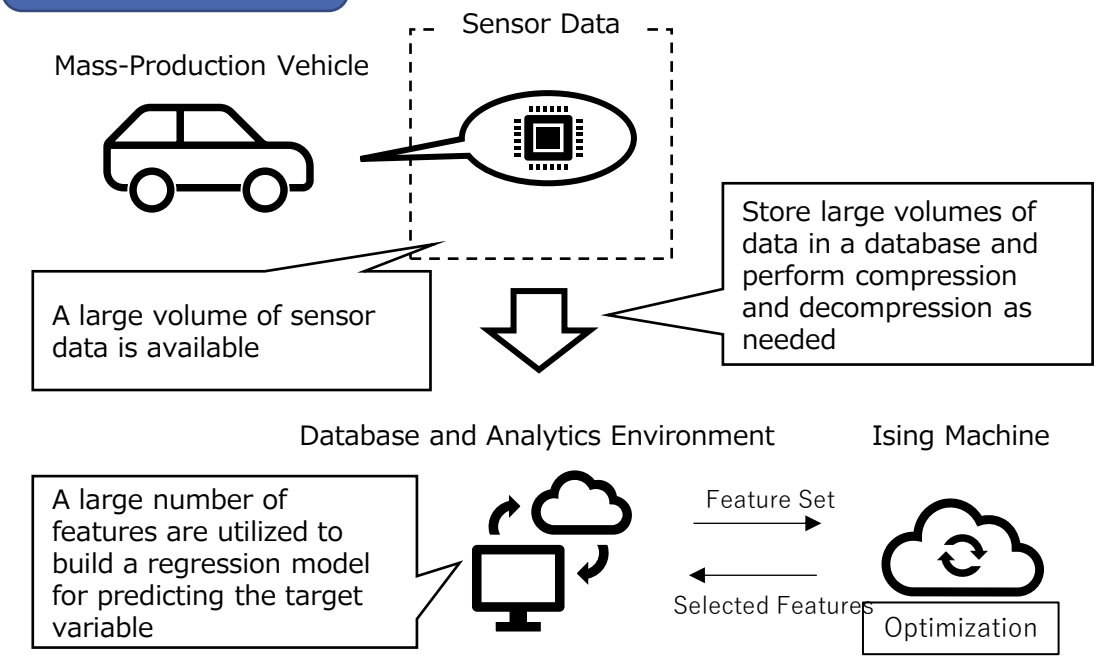
- Automated identification of relevant features from large-scale vehicle signal data

Overview of the Use Case

- Extraction of key features for predicting the time required to pass automotive engine tests using machine learning

Implementation Image

Target Realization Date: 2030



Expected Benefits

- FMQA automatically selects features from data, reducing both the effort required for feature selection and inconsistencies caused by differences in individual expertise.
- Because FMQA can identify features more quickly and comprehensively than conventional methods, improved model accuracy can be expected.

Action Plan

QRAMI	Action
Business	Cloud-Based Service for Machine Learning Feature Selection
Function	Software for Machine Learning Feature Selection
Information	Know-how for formulating the diverse operational constraints and objectives required for practical deployment
Integration	Automatic Evaluation System
Asset	Quantum Annealing / Ising Machine

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 ”.