

Fujitsu ActivateNow Technology Summit



Demo overview

1. Fujitsu quantum computing initiatives

Our presentation will showcase Fujitsu's R&D endeavors in the field of quantum computing. The scope of the technical discussion will range from quantum devices to software platforms and applications for the quantum gate system, with the aim of broadening the use cases. Additionally, a 64-qubit quantum chip developed jointly between the RIKEN Center for Quantum Computing and Fujitsu will be demonstrated.

2. Latest Digital Annealer technology for Cyclic Peptide drug discovery

Fujitsu's Digital Annealer (DA) is a cutting-edge computing technology that takes inspiration from quantum mechanics to solve complex optimization problems quickly. This has been applied in the field of drug discovery, leading to a significant reduction in the time and cost of finding new drug candidates compared to traditional laboratory experiments. Our DA has been improved by Fujitsu Research to handle problems of up to 1 Mbit in scale, which enables the search of stable structures of cyclic peptides composed of more than 20 residues, a feat that was not possible previously. We will showcase the search process of our new and improved DA.

3. Computing workload broker: enabling anyone to use next-generation computing

Our Fujitsu Computing Workload Broker (CWB) is a middleware technology that enables applications to run efficiently, regardless of the underlying complex computational infrastructure, such as quantum computers and high-performance computing (HPC) systems. Applications can operate at high speed without the need to be aware of the intricacies of the infrastructure.

4. Multi-agent reinforcement learning for network quality and power savings

Our multi-agent reinforcement learning technology satisfies both network quality and power savings via automatically controlled simulation of radio base station operations and management, using open real data from the city of Milan, Italy.

5. AutoML: automatically create code to build high-precision AI models

Automated Machine Learning (AutoML) solves the shortage of skilled data scientists in AI development by automating the construction of AI models. However, traditional AutoML can be slow and produce "black box" models that are not easily understood. Fujitsu AutoML uses program synthesis technology to create a unique program generation system for AutoML, leading to improved speed, accuracy, and interpretability. We will demonstrate this by implementing classification and regression algorithms to scenarios of hotel cancellation and housing price predictions.

6. Towards responsible AI: ready-to-use tools for ethical AI

The increased utilization of AI has made it crucial to consider the responsibility for its decisions. Conducting risk assessments of AI is a vital aspect of successful business operations. Fujitsu will present the overarching concept of our AI ethics and demonstrate two crucial tools. One tool allows for a thorough risk assessment from the design stage by referencing AI ethics guidelines, while the other helps to ensure the fairness of AI by identifying and mitigating biases that can arise from combinations of attributes.



Categorized by 5KT:

KT: key technologies

Computing

Network

AI

Converging
Technologies

Data and Security

Startup Co-creation

7. Secure AI for self-checkout

Retail customers use self-checkouts to reduce costs and limit COVID-19 spread, but losses from missing scans and scan avoidance persist. Fujitsu will demonstrate Actlyzer, our AI tech for self-checkout monitoring that provides best-in-class fraud protection. The demo will also feature patent-pending AI security tech developed with Ben-Gurion University of the Negev, Israel, that protects against future threats like adversarial patch attacks.

8. Trust-as-a-Service (TaaS): P2P transactions in the Metaverse

The rights related to digital content can be guaranteed throughout its life cycle by attaching the rights through digital signatures. This ensures that rights, such as copyright (when content is generated) and ownership (when content is sold), are maintained across different platforms and services. This creates a new ecosystem linking digital content creators and consumers that is suitable for Web3. JCB / JPGAMES and Fujitsu are currently conducting a proof of concept.

9. ConnectionChain: token trading system across multiple blockchains

The ConnectionChain technology is a token trading platform that enables interoperability among multiple blockchains. It has been utilized in proofs-of-concept for financial and environmental applications and is powered by Hyperledger Cacti, an open-source blockchain tool.

10. Facial expression recognition

This technology analyzes facial expressions in images captured by a camera. It allows for the quantification of emotions and psychological states of individuals, which was previously only possible through subjective measures.

11. Social Digital Twin: solving complex social issues

This is our solution to the social digital twin concept. This digital representation of society encompasses people, goods, and services, with the objective of addressing societal challenges. One practical application is the implementation of road pricing to decrease carbon dioxide emissions.

12. Human motion digitization technology: application to acrobatics

This technology can accurately assess and study body movements in three dimensions without the need for any attachments to the athlete. For the first time, it provides precise and quantifiable data in real-time to athletes, referees, coaches, and spectators. Its applications include digital fitness, therapeutics, and health.

13. Actlyzer: AI for video-based behavioral analysis

This technology has the capability to identify human behavior as captured in video footage. It does not require extensive prior training with vast image datasets, making it easier to develop systems that can verify and monitor human behavior.

14. MODE BizStack and Fujitsu Actlyzer: IoT and AI behavioral analysis for Digital Transformation

MODE is a Silicon Valley-based company that offers a cloud platform that simplifies IoT solutions for businesses to drive digital transformation on-site. Their product, MODE BizStack, is an all-in-one package of IoT and cloud technologies that enable business operators to access crucial information to optimize their processes and efficiency. Now, through a partnership with Fujitsu, MODE has integrated Actlyzer's AI video technology into BizStack, providing businesses with a cutting-edge tool to gain deeper insights.

15. LARUS' Galileo XAI and Fujitsu Deep Tensor: machine learning for accurate graph data classification

Developed through a collaboration between Fujitsu and Italian startup, LARUS, this technology uses machine learning to analyze graph data that represents connections between entities, such as people, objects, and events, with high precision. This combination of LARUS' graph-powered platform with Fujitsu's Finplex EnsemBiz makes it possible to achieve a highly accurate analysis of graph structure data. Fujitsu and LARUS have developed this technology to mitigate potential risks and costs facing financial institutions, delivering a solution that can automatically detect sophisticated and complex illegal transactions, including self-financing through advanced analysis and machine learning.

16. Atmonia: accelerating materials discovery with Fujitsu HPC and AI

Ammonia is a potential next-generation energy source because it doesn't emit CO₂ when generating power and it is safer and easier to transport than hydrogen. However, it does emit high levels of CO₂ emissions during its traditional production process. Atmonia, a startup from Iceland, is leveraging Fujitsu's HPC and AI technologies to accelerate the development of novel catalysts for nitrogen electrolyzers. This will enable the production of ammonia in a single-step process, using only water, nitrogen from the air, and clean electricity. Our fusion of HPC and AI enables accelerated discovery by using quantum chemical calculations and real-time AI analysis to extract causal relationships from vast amounts of data.