August 2018 Vol. 16 No. 8
NTT Technical Review 8 2018
https://www.ntt-review.jp/archive/2018/201808.html

Front-line Researchers

Hiroki Takesue, Senior Distinguished Researcher, NTT Basic Research Laboratories

▼Overview

The pace of achieving further advancements in digital computers is slowing down, but research and development of new types of computers is accelerating throughout the world. NTT has achieved a coherent Ising machine that enables high-speed computation based on phase transition phenomena in laser oscillators. Dr. Hiroki Takesue, Senior Distinguished Researcher at NTT Basic Research Laboratories, received the Nishina Memorial Prize in 2017, a prize awarded to researchers with outstanding achievements in physics and its applications. We asked him about his pioneering research results that could lead to solutions to a variety of problems facing modern society and his mind frame as a researcher.

Feature Articles
NTT's Artificial Intelligence Evolves to Create Novel Services

Developing Artificial Intelligence Services that Satisfy Customer Demands: Moving forward with Social Implementation of corevo® Technologies

▼Abstract

Artificial intelligence (AI) technologies are playing a steadily increasing role in supporting human work and social activities, such as in contact center operations and smart speaker implementations. This article introduces NTT's initiatives in developing AI technologies that are essential in providing services needed by customers in the real world, including the technologies needed for effectively utilizing AI in the real world, such as AI applications for household voice communication systems and medicine. Technologies for accelerating processing speed to collect more extensive data from the real world and improve the accuracy of AI are also introduced.

Regular Articles

Cell Encapsulation and 3D Self-assembly Using Multi-layered Polymeric Thin Films

▼Abstract

Multi-layered thin films are spontaneously folded to form three-dimensional (3D) geometries. In this study, we demonstrate that polymeric thin films are self-folded to encapsulate cells. The films consist of two types of polymers with different mechanical stiffnesses; thereby, the rolled-up 3D tubular architectures with controllable diameters are fabricated based on the strain engineering. A batch release of sacrificial layers forms the multiple cells wrapped in rolled-up films, leading to artificial reconstruction of fiber-shaped cellular 3D constructs with the intrinsic morphologies and functions of living tissues. This system can potentially provide 3D biointerfaces that are necessary for the reconstruction and assembly of functional tissues and implantable tissue grafts.

Multi-layer SDN Control Technology

▼Abstract

To cope with the transition of fixed and mobile networks to fifth-generation services and the further spread of cloud services, NTT Network Technology Laboratories is developing multi-layer software-defined networking (SDN) control technology to achieve integrated control of the IP (Internet protocol) and optical layers, on-demand support, and automatic network operations. In this article, we provide an overview of multi-layer SDN control technology and describe a technical verification test.