May 2016 Vol. 14 No. 5

NTT Technical Review 5 2016

https://www.ntt-review.jp/archive/2016/201605.html

Feature Articles
Artificial Intelligence Research Activities in NTT Group

- Artificial Intelligence Research Activities and Directions in the NTT Group
- Natural Language Processing Supporting Artificial Intelligence
- Cloud-based Interaction Control Technologies for Robotics Integrated Development Environment (R-env™)
- The Eyes as an Indicator of the Mind—A Key Element of Heart-Touching-AI
- Business Transformation Using Artificial Intelligence at NTT Communications
- Artificial Intelligence Technology Development and Its Practical Use at NTT DATA
- Utilization of Artificial Intelligence in Call Centers

Regular Articles

- Optical Switches Using Beam Steering by Computer Generated Hologram
- Edge Router System that Distributes Traffic Flexibly According to Services

Global Standardization Activities

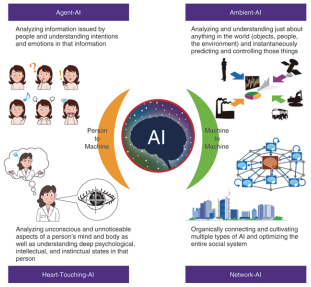
- Standardization Activities at W3C TPAC 2015

Feature Articles
Artificial Intelligence Research Activities in NTT Group

Artificial Intelligence Research Activities and Directions in the NTT Group

▼Abstract

The research and development of artificial intelligence (AI) at NTT is advancing along four directions: (1) *Agent-AI* for analyzing information issued by people and understanding intentions and emotions in that information; (2) *Heart-Touching-AI* for analyzing unconscious and unnoticeable aspects of a person's mind and body and understanding deep psychological, intellectual, and instinctual states in that person; (3) *Ambient-AI* for analyzing and understanding just about anything in the world (objects, people, the environment) and instantaneously predicting and controlling those things; and (4) *Network-AI* for organically connecting and cultivating multiple types of AI and optimizing the entire social system. This article introduces the technologies supporting these four forms of AI and specific AI-related activities in the NTT Group.

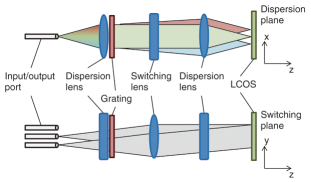


Regular Articles

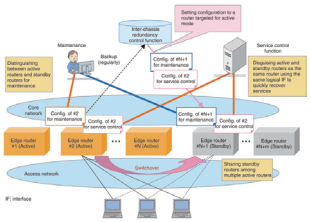
Optical Switches Using Beam Steering by Computer Generated Hologram

▼Abstract

We describe a computer generated hologram (CGH) method that is applicable to a multiple input and multiple output (MxN) optical switch based on liquid crystal on silicon (LCOS). The optics of the conventional MxN optical switch require multiple spatial light modulations. In addition, a phase pattern designed using the CGH method achieves a simple MxN optical switch with a single spatial phase modulation. Moreover, the intrinsic loss of the proposed MxN switch from beam splitting can be reduced by routing multiple signals with a single knob control. We demonstrate a 4x4 wavelength selective switch and a 2-degree reconfigurable optical add/drop multiplexer switch based on the above CGH method. The experimental results indicate that these switches work well with a crosstalk of < –20.0 dB.



Edge Router System that Distributes Traffic Flexibly According to Services

▼Abstract

In the future, communication networks will need to provide various services more flexibly and efficiently according to the diversified needs of customers and service partners. NTT Network Service Systems Laboratories is researching and developing an edge router system that distributes traffic flexibly to various service functions in a network. This system is being developed in order to reduce costs by increasing transfer capacity and reducing power consumption, and to respond to service needs flexibly by employing traffic distribution and policy control functions.