External Awards

Achievement Award
Winners: Shinji Matsuo, NTT Device Technology Laboratories; Koji Takeda, NTT Device Technology Laboratories; Takuro Fujii, NTT Device Technology Laboratories
Date: June 6, 2024
Organization: The Institute of Electronics, Information and Communication Engineers (IEICE)

For pioneering research on membrane lasers on Si.

Outstanding Catalyst - Beyond Telco
Winner: Autonomous Network Hyperloops Phase V Team (Antel, Celfocus, Chunghwa Telecom, Cognizant, ESRI, Futurewei, Infosim, Intersec, MTN, NTT, Orange, Telecom Italia, UBiqube, and Verizon)
Date: June 20, 2024
Organization: TMF

For "Autonomous Networks Hyperloops - Phase V - Virtual Command Center as a Service."

The 35th Radio Achievement Award, Minister of Internal Affairs and Communications Award
Winner: Doohwan Lee, NTT Network Innovation Laboratories
Date: June 25, 2024
Organization: Association of Radio Industries and Businesses (ARIB)

For research and development of OAM-MIMO wireless multiplexing technology.

Best Demo Award
Winners: Hiroki Baba, NTT Network Service Systems Laboratories; Shiku Hirai, NTT Network Service Systems Laboratories; Kentarou Hayashi, NTT Network Service Systems Laboratories; Tomonori Takeda, NTT Network Service Systems Laboratories
Date: June 27, 2024
Organization: The 10th IEEE International Conference on Network Softwarization (IEEE Netsoft 2024)

For "In-network Computing Architecture for Service Acceleration for 6G Networks."
Published as: H. Baba, S. Hirai, K. Hayashi, and T. Takeda, "In-network Computing Architecture for Service Acceleration for 6G Networks," IEEE Netsoft 2024, St. Louis, MO, USA, June 2024.

Papers Published in Technical Journals and Conference Proceedings

Distribution of Control during Bimanual Movement and Stabilization

A. Takagi and M. Kashino

Scientific Reports, Vol. 14, 16506, July 2024.

In two-handed actions like baseball batting, the brain can allocate the control to each arm in an infinite number of ways. According to hemispheric specialization theory, the dominant hemisphere is adept at ballistic control, while the non-dominant hemisphere is specialized at postural stabilization, so the brain should divide the control between the arms according to their respective specialization. Here, we tested this prediction by examining how the brain shares the control between the dominant and non-dominant arms during bimanual reaching and postural stabilization. Participants reached with both hands, which were tied together by a stiff virtual spring, to a target surrounded by an unstable repulsive force field. If the brain exploits each hemisphere's specialization, then the dominant arm should be responsible for acceleration early in the movement, and the non-dominant arm will be the prime actor at the end when holding steady against the force field. The power grasp force, which signifies the postural stability of each arm, peaked at movement termination but was equally large in both arms. Furthermore, the brain predominantly used the arm that could use the stronger flexor muscles to mainly accelerate the movement. These results point to the brain flexibly allocating the control to each arm according to the task goal without adhering to a strict specialization scheme.

Efficient Fiber-inspection and Certification Method for Optical-circuit-switched Datacenter Networks

K. Anazawa, T. Inoue, T. Mano, H. Nishizawa, and E. Oki

Journal of Optical Communications and Networking, Vol. 16, No. 8, pp. 788–799, July 2024.

Datacenter networks (DCNs) consisting of optical circuit switches (OCSs) have been considered as a promising solution to dramatically improve their transmission capacity, energy efficiency, and communication latency. To scale optical-circuit-switched DCNs (OCS DCNs), hierarchical OCSs with tens of thousands of optical fibers need to be installed, and they should be inspected before starting datacenter operations. Since traditional DCNs consist of electrical-packet switches (EPSs), the condition and cabling of fibers can be inspected easily by probing neighboring EPSs. However, OCS networks cannot be inspected in the same manner because OCSs cannot transmit and receive probe signals. Thus, we have had to attach and detach a light source and power meter (LSPM) to every switch for probing all the fibers, which takes weeks. This paper proposes an efficient method for inspecting and certifying fibers in an entire DCN without repeating LSPM reattachment. Our method is based on (1) theories on quickly estimating the fiber condition on the basis of the intensity of received probe signals, (2) the maximum allowable loss of each fiber derived from the transceiver budget used in operations, and (3) an algorithm that reduces the number of probes needed. The results from an extensive numerical evaluation indicate that our method inspected a DCN with 18,432 fibers in at most a day, whereas a baseline method involving repeated LSPM reattachment would take more than a week. We also confirmed that our method never produced false negatives and false positives under practical network conditions.