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Photonic Brain-Machine Interfaces

Initiative: Momentum - Förderung für Erstberufene

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Nature has developed some of the most advanced systems through continuous evolution. Bio-inspired approaches following these biological blueprints allow for drastically enhancing the performance synthetic devices, in particular devices with adaptive and learning capability. In this context, brain-inspired computing architectures have led to tremendous progress in artificial intelligence and deep-learning and strong efforts are ongoing to build hardware mimics of life neural networks. However, why not harness the outstanding capabilities of biological neural tissue and rather implement efficient communication interfaces, which connect these powerful computing networks to synthetic information processing systems? This approach is at the heart of the concept. Photonic brain-machine interfaces will overcome long-range speed limitations imposed by propagation along nerve cells by replacing them with optical fibers. This enables implementing distributed biohybrid systems that communicate with light. Such devices will allow for re-connecting damaged nervous strands, provide biological access to light-based sensors and eventually enable biohybrid computing.

Projektbeteiligte

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Es werden die Institutionen genannt, an denen das Vorhaben durchgeführt wurde, und nicht die aktuelle Adresse.

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