

Special Issue

Neural Mechanisms of Brain–Computer Interfaces

Message from the Guest Editor

Brain–computer interfaces (BCIs) have rapidly evolved from experimental tools into promising technologies for restoring communication, motor control, and interaction with the environment. Beyond their applied value, BCIs provide a unique opportunity to probe and modulate the neural mechanisms underlying brain function.

Increasing evidence suggests that BCI use may drive neural plasticity, reshaping brain activity and connectivity through training, feedback, and interaction with external devices. However, the precise mechanisms by which BCIs induce and sustain plastic changes remain insufficiently described. A clearer understanding of these processes is crucial for optimizing BCI design, maximizing clinical benefits, and advancing fundamental neuroscience. This Special Issue brings together original research, reviews, and perspectives that address the neural mechanisms of BCIs, with particular emphasis on their potential to induce neural plasticity. By consolidating current knowledge and highlighting open questions, we aim to stimulate further experimental and theoretical studies that will advance this emerging field.

Guest Editor

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