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Combined Natural and Artificial Neural Network Learning in Prosthesis Controld

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Editorial

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Editorial

One of the most difficult tasks in neurotherapy is to restore neural functionality after nerve surgery interfacing prostheses. A great amount of hope as well as comforting results are thus the effort towards nerve-prosthesis interfacing where commands to the prosthesis are not given by vicariating muscle EMG as tradition, but through the very residual nerves interfacing the prostheses via a kind of artificial neural network. Being in fact quite difficult to model and reconstruct the real transfer function from nerve spiking to prosthesis actuation, a black box solution is given by learning such embedded transfer function via trials and errors, as we do when newborns, with the aid of an interposed artificial neural network.

The tricky point with respect to the standard artificial neural network learning is that the learning process could more easily involve not just such artificial neural network, but also the residual natural neural network of the patient. Leaning via biofeedback will thus be distributed partly on the artificial neural network and in part within the subject's brain, whose behaviour will thus more easily and faster integrate the prosthetic aid in daily life.