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***Exploitation and usage of signal evaluating concepts of nature
Ultrasonic data acquisition and neural network signal processing***

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The objective of the work is the mapping of the main features of data acquisition and neural signal processing concepts, which can be found in nature like the biosonar of bats and dolphins, to technical applications like medical ultrasound or material testing. A first attempt in this direction was the exploitation of higher harmonics of an emitted ultrasound wave for the measurement of very weak signals by an acousto-optical Mach-Zehnder- and Sagnac-Interferometer. A second ongoing work is the analysis of a frequency-modulated signal by neural network signal processing methods for the purpose of medical ultrasound application. The first promising results give rise to the hope of further technical applications.

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