# Gesture recognition with Brownian reservoir computing using geometrically confined skyrmion dynamics

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Reservoir computing (RC) is a promising path for reducing the power consumption of artificial intelligence applications. Spintronic systems are currently under intense investigation for implementation RC. We use a new spintronic concept comprising confined dynamics of magnetic skyrmions to decode different human gestures obtained from doppler radar data [1]. Each gesture is reduced to a 1D time series and then converted to a voltage signal, driving the skyrmion trajectory evolution on the intrinsic time scales of the real-world temporal patterns. We demonstrate competitive or superior performance compared to energy-intensive software-based neural networks. As the time scales of skyrmion dynamics are in principle scalable by orders of magnitude (e.g. by miniaturization or material adjustments), the device can be designed to match a variety of time series classification problems.

[1] G. Beneke, Th. Winkler, et. al, arXiv:2403.01877 (Nat. Commun., in press 2024)