

# **CONNECTIONS BETWEEN SEQUENTIAL FILTERING AND EVOLUTIONARY DYNAMICS**

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It has long been posited that there is a connection between evolutionary dynamics and sequential learning methods. This talk is structured in two parts: the first focuses on a unifying framework for so-called controlled particle filters and a smooth formulation of the Kushner-Stratonovich equation. The second part of the talk utilises this smooth formulation to draw precise connections between nonlinear filtering and replicator dynamics, with special focus on the linear Gaussian setting and connections to various Kalman dynamics. It is hoped this work will spur further research into exchanges between sequential learning and evolutionary biology.