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Landscape Construction in Dynamical Systems YING TANG, RUOSHI YUAN, GAOWEI WANG, PING AO, Shanghai Jiao Tong Univ — The idea of landscape has been recently applied to study various of biological problems. We demonstrate that a dynamical structure built into nonlinear dynamical systems allows us to construct such a global optimization landscape, which serves as the Lyapunov function for the ordinary differential equation. We find exact constructions on the landscape for a class of dynamical systems, including a van der Pol type oscillator, competitive Lotka-Volterra systems, and a chaotic system. The landscape constructed provides a new angle for understanding and modelling biological network dynamics.

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