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Controllability of energy landscapes by varying correlations between minima SAI TEJA PUSULURI, Department of Physics and Astronomy & NQPI, Ohio University, ALEX H. LANG, Salk Institute, PANKAJ MEHTA, Boston University, HORACIO E. CASTILLO, Department of Physics and Astronomy & NQPI, Ohio University — Neural network models have been used recently to generate complex energy landscapes for modeling various biological processes, including protein folding, HIV evolution and cellular reprogramming [1-5]. In these constructions, the minima of the energy landscape correspond to memory patterns of the neural network. A good understanding of the static and dynamic properties of energy landscapes can be helpful in gaining better insight into those processes. Here, we demonstrate that the correlations between memory patterns strongly affect some of those properties, including the basin sizes of energy minima, the density of metastable states, the stability of global energy minima against perturbations, and the switching rates between global energy minima in the presence of an external bias.

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