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Experimental entanglement estimation for a general unknown input state of a multiqubit system ELIZABETH BEHRMAN, Department of Mathematics and Physics, Wichita State University, JAMES STECK, Department of Aerospace Engineering, Wichita State University — Measurement of entanglement remains an important problem for quantum information. We present the design and simulation of an experimental method for entanglement estimation for a general, unknown, state of a multiqubit system. The state can be in pure or mixed, and it need not be "close" to any particular state. Our method, based on dynamic learning, does not require prior state reconstruction or lengthy optimization. Results for three-qubit systems compare favorably with known entanglement measures. The method is then extended to four- and five-qubit systems, with relative ease. As the size of the system grows the amount of training necessary diminishes, raising hopes for applicability to large computational systems.

Elizabeth Behrman
Wichita State University

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