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Taylor Meredith* (taylor.meredith@nyu.edu), **Iddo Ben-Ari**, **Hugo Panzo**, **Xioran Tan**
and **Jonah Green**. *A Finite-Memory Elephant Random Walk and the Central Limit Theorem for Additive Functionals of Markov Chains.*

The Central Limit Theorem (CLT) for additive functionals of Markov chains is a well known result with a long history. In this talk, we present applications of the CLT to two finite-memory versions of the Elephant Random Walk. Our results solve the problem of cumbersome computations for higher order moments and thus, we use these moments to prove limit theorems. We present a more accessible derivation of the CLT for additive functionals of finite state Markov chains, which is based on positive recurrence, the CLT for IID sequences and linear algebra, and which focuses on characterization of the variance. (Received September 17, 2019)