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Capturing correlation structure within a simplified population density framework

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We have developed a population density framework that captures correlations between any pair of neurons in the population. Completely representing the correlation structure among neurons would require high-dimensional densities. Hence, we developed a method to simplify the correlation structure by approximating the input to each population of neurons as correlated Poisson processes. The key challenge we address is that of capturing the effect of delayed correlation with such simplified input. We demonstrate the ability of this approach to capture how correlations propagate through networks by comparing our results with Monte-Carlo simulations.