

Figure 1: BIC-optimal state frequency for 2-6 state HMMs with and without covariate transition on 100 two-state hidden Markov models with covariate transitioning simulations.

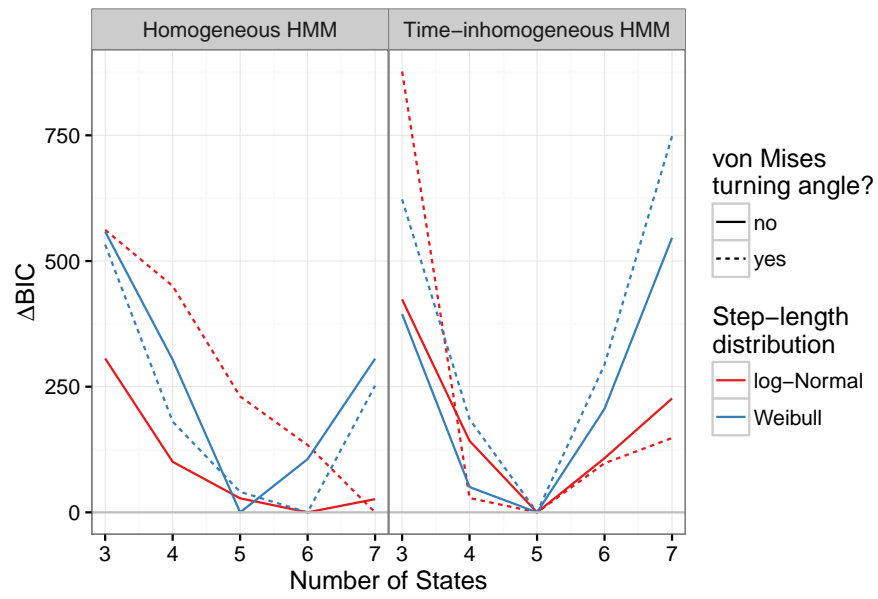


Figure 2: Adjusted Bayesian information criterion values for 3-7 state HMMs with different step-length distributions, with and without temporal transitions and turning angles.

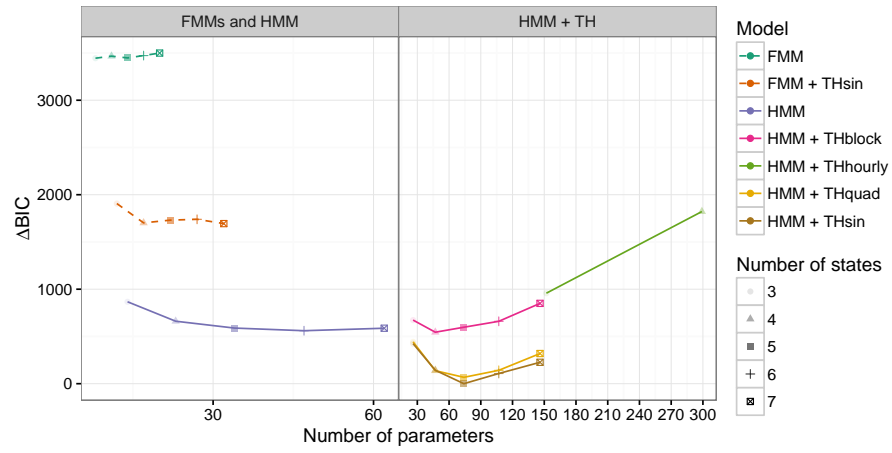


Figure 3: Adjusted BIC by number of free parameters for HMM model types. The left panel shows FMM, FMM with a sin prior and HMM. The right panel shows HMMs with different temporal transitions.

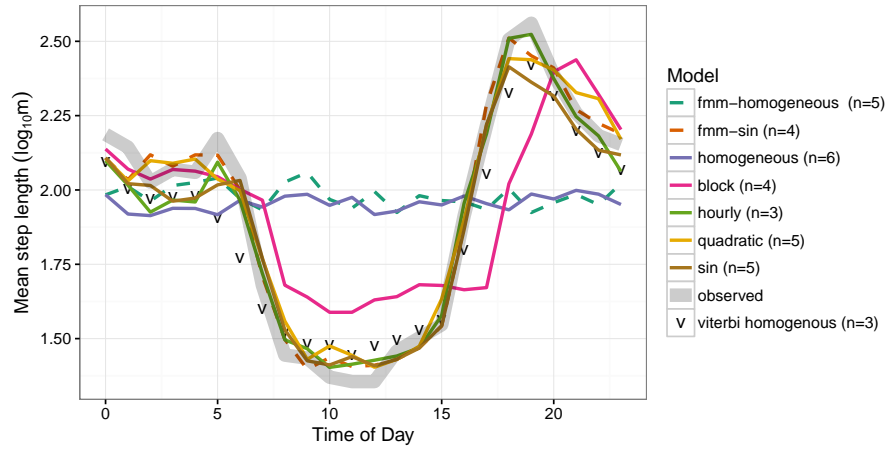


Figure 4: Average step length by time of day observed (gray highlight), three-state HMM Viterbi predictions (V points), and all transitions type HMMs predictions (out of sample) with their respective BIC-optimal states.

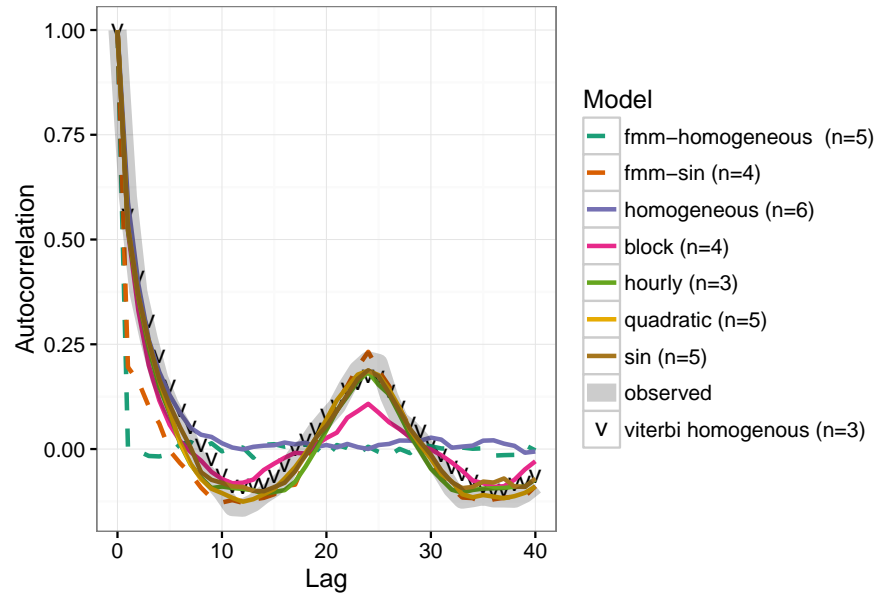


Figure 5: Autocorrelation of observed (gray highlight), three-state HMM Viterbi predictions (V points), and all transitions type HMMs predictions (out of sample) with their respective BIC-optimal states

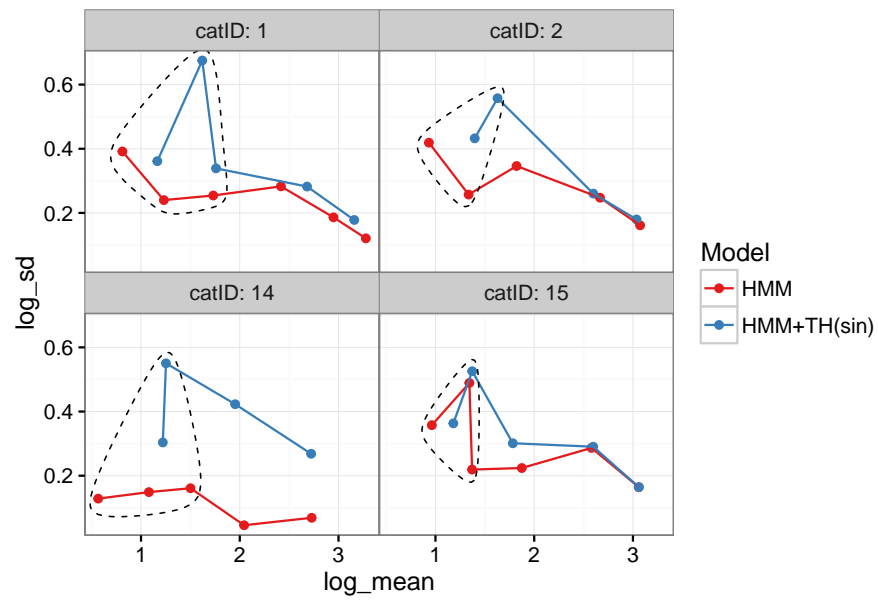


Figure 6: State identification plot with log mean and standard deviation of BIC-optimal HMM and HMM with sinusoidal transition.

1 Additional files

