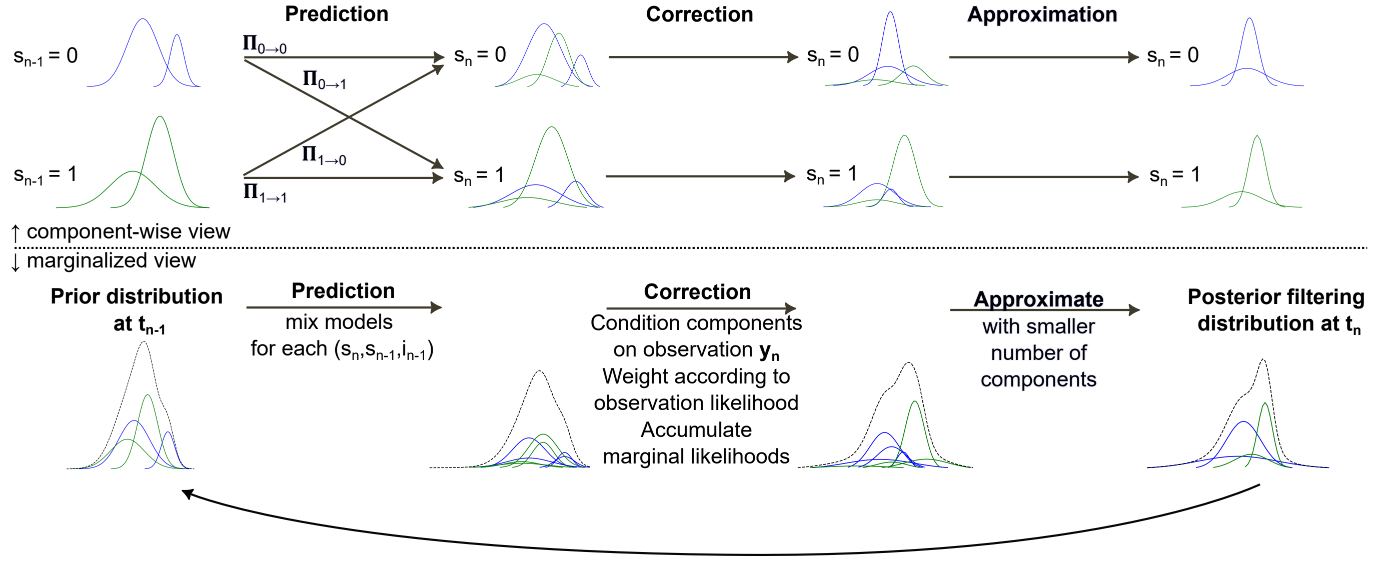
Prediction
Correction
Approximation
$s_{n-1} = 0$
$\Pi_{0\to0}$
$\Pi_{0\to1}$
$\Pi_{1\to0}$
$\Pi_{1\to1}$
$s_{n-1} = 1$
$s_n = 0$
$s_n = 1$
$s_n = 0$
$s_n = 1$
$s_n = 0$
$s_n = 1$
↑ component-wise view
↓ marginalized view
Prior distribution at $t_{n-1}$
Prediction
mix models for each $(s_n, s_{n-1}, i_{n-1})$
Correction
Condition components on observation $\mathbf{y}_n$
Weight according to observation likelihood
Accumulate marginal likelihoods
Approximate
with smaller number of components
Posterior filtering distribution at $t_n$