On the Convergence of Mean Field Procedures for MRF’s

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In [1], Zhang attempts to establish convergence of a mean-field iteration for an Ising Markov random field for large values of the hyperparameter $\beta$. Unfortunately, equation (16b), which states

$$|T_\delta(u_1) - T_\delta(u_2)| \leq |u_1 - u_2|,$$

is not correct for the function $T_\delta(u)$ defined in (15) and Fig. 2. In fact, any function that satisfies (16b) for all $u_1$ and $u_2$ is necessarily a continuous function, unlike the particular $T_\delta(u)$ defined in (15).

Thus the convergence of the mean field iteration remains an important open question for large $\beta$.

References