

The purpose of this erratum is simply to point out the problems that could seriously impede reading as I become aware of them.

Page 193, top, it is not true that this matrix is definite positive. This is the case only if $g_{i,j} \geq 0$. When $h = 0$ one can reduce to this case by symmetry, but not when $h \neq 0$. Thus Theorem 2.15.1 is not proved in when $h \neq 0$. This was kindly pointed out to me by S. Starr.

The previous mistake was actually quite fruitful, because in trying to repair it I wrote the paper 'Large Deviation, A.S.S. schemes and the General Parisi Hypothesis' that will appear in Journal of Statistical Physics. In this paper the limit (2.547) is computed for all $n > 0$, and it is shown that the formula (2.547) is correct for all $n > 0$

The following comments are provided by D. Panchenko about the Hopfield model, in the unlikely event that this chapter finds a second reader.

page 340, line -7: good to mention "... because $m^* \leq 1 \leq \beta$."

page 341, line -2: R_M not R_N

page 345, line 4 (in the first equation): second term missing a factor $1/2$

page 346, eq. (5.98): on the right had side $\|z\|^2$

page 347, line 4 (in the first line of three line equation): on the left had side $\varphi(\dots)$ should not be there, and on the right hand side inside the log should be $(1 + a^*/8)^{1/2}$, square root is missing.

page 349, line - 7, equation above lemma 5.3.11; should be $\min(d, \dots)$

page 350, line -9: should be $C = \exp(+N\dots)$

page 351, line 11: By (5.113) should be "By (5.314)"

page 381, eq. (5.217): $\beta\mu + h$

page 381, Lemma 5.7.1: good to mention that f^- can depend on $\eta_{i,k}$, which is used later

page 385: If one were to reorganize the chapter to present smart path method and its application first and a priori estimates later, then it is good to mention that Proposition 5.7.6 is a central connection here, and a central result. It is used to control remainder in (5.248), and its consequence (5.240) is important on page 400.

page 390, eq. (5.255): on the right hand side $\varepsilon_l \varepsilon_{l'}$ is missing

page 390, Theorem 5.8.1: f only does not depend on $\eta_{i,M}$ which is used later

page 391, above eq. (5.265): bad notation for η_k since before η_k was defined as $\eta_{N,k}$. This will lead to small confusion which I will mention later.

page 394, lines -4,-5,-6: It also includes the case $h = 0$ since in that case $\mu = 0$ so (5.279) still holds.

page 398, eq. (5.301): Actually, $S_{l,l'}$ also do not depend on η_k , which here stand for $\eta_{k,M}$. Confusion comes from page 391. So decomposing $S_{l,l'}$ is not necessary and this whole page can be simplified.

page 399, lines 6 and 10: $n = 3$ should be $n = 2$

page 399, line -3: $f = S_{1,1} - s$

page 400, line 2: One could also use the set $\{|S_{1,l}| \geq \rho^2\}$ and replace $s + \rho^2$ by ρ^2

page 400, line -5: the first equality is approximate since $m_1 = \sum_{i \leq N} \sigma_i / N$ not $\sum_{i \leq N-1}$

page 401, eq. (5.314); the right hand side should be

$$\beta^4 \rho M_N^{1/2} (R_N^{1/2} + S_N^{1/2} + M_N^{1/2})$$

just like in (5.297). Then to avoid the problem described below one needs to use three derivatives in theorem 5.7.8.

page 401, line -5: "bt" should be "by"