

Errata to R. Kwitt and A. Uhl, “Lightweight
Probabilistic Texture Retrieval”, IEEE
Transactions on Image Processing, 19(1):241–253,
January 2010

Corrections

There is a typo in the derivation of the Newton-Raphson update step for the Gumbel (EV Type I) distribution. Eq. (21) lists $f(\sigma)$ which is correct, but Eq. (22) contains an error. The published version is

$$f'(\sigma) := \frac{\partial}{\partial \sigma} f(\sigma) = \frac{1}{\sigma^2} \sum_{i=1}^N y_i^2 \exp\left(-\frac{y_i}{\sigma}\right) - \sum_{i=1}^N \exp\left(-\frac{y_i}{\sigma}\right) - \frac{1}{\sigma} \sum_{i=1}^N y_i \exp\left(-\frac{y_i}{\sigma}\right) \quad (1)$$

and the corrected version (two signs, one additional term) reads as

$$f'(\sigma) := \frac{\partial}{\partial \sigma} f(\sigma) = \frac{1}{\sigma^2} \sum_{i=1}^N y_i^2 \exp\left(-\frac{y_i}{\sigma}\right) + \sum_{i=1}^N \exp\left(-\frac{y_i}{\sigma}\right) + \frac{1}{\sigma} \sum_{i=1}^N y_i \exp\left(-\frac{y_i}{\sigma}\right) - \bar{y} \frac{1}{\sigma^2} \sum_{i=1}^N y_i \exp\left(\frac{y_i}{\sigma}\right) \quad (2)$$

In an implementation, this error is usually not noticeable, since the moment estimates to start the NR iteration are already that good most of the times so that the NR algorithm is never invoked. Sorry for any inconvenience.