Appendix 1 Structural similarity formula

The Structural Similarity (SSIM) measures the differences between images in terms of three different dimensions: brightness, contrast, and structure, and is defined as follows:

$$SSIM = \frac{\left(2\mu_x\mu_y + c_1\right)\left(2\sigma_{xy} + c_2\right)}{\left(\mu_x^2 + \mu_y^2 + c_1\right)\left(\sigma_x^2 + \sigma_y^2 + c_2\right)}$$

In the above equation, μ_x and μ_y represent the means of image x and image y, respectively. The parameters σ_x^2 and σ_y^2 denote the variances of image x and image y, respectively, and σ_{xy} represents the covariance of image x and image y. The parameters c_1 and c_2 are constants used to avoid division by zero in the denominator and resolve the resultant instability. The SSIM ranges from 0 to 1, the closer to 1 the SSIM is, the closer the two images in terms of structure.