Trasformate Z più significative

Indichiamo con R il raggio della circonferenza all'esterno della quale è definita la $\mathcal{Z}$–Trasformata.

$$\{f_n\}_{n\in\mathbb{N}}, \qquad F^*(z) = \mathcal{Z}(f_n) = \sum_{n=0}^{+\infty} f_n\, z^{-n}, \qquad |z| > R \tag{0.1}$$

$$g_n = c^{-n} f_n,\ c > 0, \qquad G^*(z) = F^*(cz), \qquad R_g = \frac{R_f}{c} \tag{0.2}$$

$$k \geq 1, \quad g_n = \begin{cases} f_{n-k}, & \text{se} \quad n-k \geq 0 \\ 0, & \text{se} \quad n-k < 0 \end{cases}, \qquad G^*(z) = z^{-k} F^*(z), \qquad R_g = R_f \tag{0.3}$$

$$k \geq 1, \quad g_n = f_{n+k}, \qquad G^*(z) = z^k \left[F^*(z) - \sum_{n=0}^{k-1} z^{-n} f_n \right], \qquad R_g = R_f \tag{0.4}$$

$$g_n = \Delta f_n = f_{n+1} - f_n, \qquad G^*(z) = (z-1)F^*(z) - z f_o, \qquad R_g = R_f \tag{0.5}$$

$$g_n = \Delta^2 f_n = f_{n+2} - 2f_{n+1} + f_n, \quad G^*(z) = (z-1)^2 F^*(z) - z(z-1)f_o - z\Delta f_o, \quad R_g = R_f \tag{0.6}$$

$$g_n = \begin{cases} 0, & \text{se} \quad n = 0 \\ \sum_{k=0}^{n-1} f_k, & \text{se} \quad n \geq 1 \end{cases}, \qquad G^*(z) = \frac{1}{z-1} F^*(z), \qquad R_g = \max\{1, R_f\} \tag{0.7}$$

$$g_n = \sum_{k=0}^{n} f_n, \qquad G^*(z) = \frac{z}{z-1} F^*(z), \qquad R_g = \max\{1, R_f\} \tag{0.8}$$

$$g_n = n\, f_n, \qquad G^*(z) = -z \frac{d}{dz} F^*(z), \qquad R_g = R_f \tag{0.9}$$

$$h_n = \sum_{k=0}^{n} f_k\, g_{n-k}, \qquad H^*(z) = F^*(z) G^*(z), \qquad R_h = \max\{R_f, R_g\} \tag{0.10}$$

$$h_n = f_n\, g_n, \qquad H^*(z) = \frac{1}{2\pi i} \int_{C_r(0)} F^*(\zeta) G^*(\frac{z}{\zeta}) \frac{d\zeta}{\zeta}, \qquad R_f < r < \frac{|z|}{R_g} \tag{0.11}$$

$$f_o = 0, \quad g_n = \begin{cases} 0, & \text{se} \quad n = 0 \\ \frac{f_n}{n}, & \text{se} \quad n \geq 1 \end{cases}, \qquad G^*(z) = \int_z^{z_\infty} \frac{F^*(s)}{s} ds, \qquad R_g = R_f \tag{0.12}$$

$$\alpha \in \mathbb{C}, \quad f_n = e^{\alpha n}, \qquad F^*(z) = \frac{z}{z - e^\alpha}, \qquad R_f = |e^\alpha| \tag{0.13}$$

$$\text{Se} \quad e^\alpha = 1, \quad F^*(z) = \frac{z}{z-1}; \qquad \text{se} \quad e^\alpha = -1, \quad F^*(z) = \frac{z}{z+1} \tag{0.14}$$

$$f_n = \binom{n}{k}, \qquad F^*(z) = \frac{z}{(z-1)^{k+1}}, \qquad R_f = 1 \tag{0.15}$$

$$f_n = n = \binom{n}{1}, \qquad F^*(z) = \frac{z}{(z-1)^2}, \qquad R_f = 1 \tag{0.16}$$

$$f_o = 0, \quad f_n = \frac{1}{n}, \qquad F^*(z) = \log \frac{z}{z-1}, \qquad R_f = 1 \tag{0.17}$$

$$a \in \mathbb{C}, \quad f_n = \frac{a^n}{n!}, \qquad F^*(z) = \exp \frac{a}{z}, \qquad |z| \neq 0 \tag{0.18}$$

$$f_n = \frac{1}{2\pi i} \int_{C_{\bar{R}}(0)} \frac{F^*(z)}{z^{1-n}} \, dz, \qquad \bar{R} > R_f. \tag{0.19}$$

$$f_n = \frac{1}{n!} \left(\frac{d^n}{dz^n} F^*(z^{-1}) \right) \Big|_{z=0} \tag{0.20}$$

$$F_{n+N} = f_n, \quad N \in \mathbb{N}, \qquad F^*(z) = \frac{1}{1 - z^{-N}} \sum_{k=0}^{N-1} z^{-k} f_k, \qquad R_f = 1 \tag{0.21}$$