STATISTICAL averages (for a stationary random process)	**TEMPORAL averages**
Average value $\overline{x}=\int_{-\infty}^{\infty} x\cdot w(x)\,dx$	**Average value** Continuous: $\overline{x(t)}=\lim\limits_{T\to\infty}\frac{1}{2T}\int_{-T}^{T} x(t)\,dt$ Discrete: $\overline{x[t]}=\lim\limits_{N\to\infty}\frac{1}{2N+1}\sum_{t=-N}^{N} x[t]$ Discrete & finite: $\overline{x[t]}=\frac{1}{how\ many}\sum_{all} x[t]$
Average squared value $\overline{x^2}=\int_{-\infty}^{\infty} x^2\cdot w(x)\,dx$	**Average squared value** Continuous: $\overline{x^2(t)}=\lim\limits_{T\to\infty}\frac{1}{2T}\int_{-T}^{T} x^2(t)\,dt$ Discrete: $\overline{x[t]}=\lim\limits_{N\to\infty}\frac{1}{2N+1}\sum_{t=-N}^{N} x^2[t]$ Discrete & finite: $\overline{x[t]}=\frac{1}{how\ many}\sum_{all} x^2[t]$
Variance $\sigma^2=\int_{-\infty}^{\infty} (x-\overline{x})^2\cdot w(x)\,dx$	**Variance** Continuous: $\overline{\sigma^2}=\lim\limits_{T\to\infty}\frac{1}{2T}\int_{-T}^{T} (x(t)-\mu)^2\,dt$ Discrete: $\overline{x[t]}=\lim\limits_{N\to\infty}\frac{1}{2N+1}\sum_{t=-N}^{N} (x[t]-\mu)^2$ Discrete & finite: $\overline{x[t]}=\frac{1}{how\ many}\sum_{all} (x[t]-\mu)^2$
Autocorrelation function $R_{ff}(\tau)=\overline{f(t)\cdot f(t+\tau)}=$ $=\int_{-\infty}^{\infty}\int_{-\infty}^{\infty} x_1 x_2\cdot w(x_1, x_2;\tau)\,dx_1\,dx_2$	**Autocorrelation function** Continuous: $R_{xx}(\tau)=\overline{x(t)\cdot x(t+\tau)}=$ $=\lim\limits_{T\to\infty}\frac{1}{2T}\int_{-T}^{T} x(t)\cdot x(t+\tau)\,dt$ Discrete: $R_{xx}[\tau]=\overline{x[t]\cdot x[t+\tau]}=$ $=\lim\limits_{N\to\infty}\frac{1}{2N+1}\sum_{t=-N}^{N} x[t]\cdot x[t+\tau]$ Discrete & finite: $R_{xx}[\tau]=\overline{x[t]\cdot x[t+\tau]}=$ $=\frac{1}{how\ many}\sum_{t=all} x[t]\cdot x[t+\tau]$

Cross-correlation function	Cross-correlation function
$R_{fg}(\tau) = \overline{f(t) \cdot g(t+\tau)} =$ $= \int_{-\infty}^{\infty} \int_{-\infty}^{\infty} x_1 y_2 \cdot w(x_1, y_2; \tau) dx_1 dy_2$	Continuous: $R_{xy}(\tau) = \overline{x(t) \cdot y(t+\tau)} =$ $= \lim_{T \to \infty} \frac{1}{2T} \int_{-T}^{T} x(t) \cdot y(t+\tau) dt$ Discrete: $R_{xy}[\tau] = \overline{x[t] \cdot y[t+\tau]} =$ $= \lim_{N \to \infty} \frac{1}{2N+1} \sum_{t=-N}^{N} x[t] \cdot y[t+\tau]$ Discrete & finite: $R_{xy}[\tau] = \overline{x[t] \cdot y[t+\tau]} =$ $= \frac{1}{how\ many} \sum_{t=all} x[t] \cdot y[t+\tau]$

- $F(x) = \frac{1}{2}\left(1 + \text{erf}\left(\frac{x-\mu}{\sigma\sqrt{2}}\right)\right)$
- $(r - s_0(t_0))^2 \underset{H_0}{\overset{H_1}{\gtrless}} (r - s_1(t_0))^2 + 2\sigma^2 \cdot \ln(K)$
- $r \gtrless \underbrace{\frac{s_0(t_0) + s_1(t_0)}{2} + \frac{\sigma^2}{s_1(t_0) - s_0(t_0)} \cdot \ln(K)}_{T}$