Notations

$\langle f, g \rangle$	Inner product (A.6)
$\|f\|$	Euclidean or Hilbert space norm
$\|f\|_1$	$\mathbf{L}^1$ or $\mathbf{l}^1$ norm
$\|f\|_\infty$	$\mathbf{L}^\infty$ norm
$f[n] = O(g[n])$	Order of: there exists K such that $f[n] \leqslant Kg[n]$
$f[n] = o(g[n])$	Small order of: $\lim_{n \to +\infty} \frac{f[n]}{g[n]} = 0$
$f[n] \sim g[n]$	Equivalent to: $f[n] = O(g[n])$ and $g[n] = O(f[n])$
$A < +\infty$	A is finite
$A \gg B$	A is much bigger than B
z^*	Complex conjugate of $z \in \mathbb{C}$
$\lfloor x \rfloor$	Largest integer $n \leqslant x$
$\lceil x \rceil$	Smallest integer $n \geqslant x$
$(x)_+$	$\max(x, 0)$
$n \bmod N$	Remainder of the integer division of n modulo N

Sets

$\mathbb{N}$	Positive integers including 0
$\mathbb{Z}$	Integers
$\mathbb{R}$	Real numbers
$\mathbb{R}^+$	Positive real numbers
$\mathbb{C}$	Complex numbers
$|\Lambda|$	Number of elements in a set Λ

Signals

$f(t)$	Continuous time signal
$f[n]$	Discrete signal
$\delta(t)$	Dirac distribution (A.30)
$\delta[n]$	Discrete Dirac (3.32)
$\mathbf{1}_{[a,b]}$	Indicator of a function that is 1 in $[a, b]$ and 0 outside

Spaces

$\mathbf{C}_0$	Uniformly continuous functions (7.207)
$\mathbf{C}^p$	p times continuously differentiable functions
$\mathbf{C}^\infty$	Infinitely differentiable functions
$\mathbf{W}^s(\mathbb{R})$	Sobolev^s times differentiable functions (9.8)
$\mathbf{L}^2(\mathbb{R})$	Finite energy functions $\int |f(t)|^2 \, dt < +\infty$
$\mathbf{L}^p(\mathbb{R})$	Functions such that $\int |f(t)|^p \, dt < +\infty$
$\ell^2(\mathbb{Z})$	Finite energy discrete signals $\sum_{n=-\infty}^{+\infty} |f[n]|^2 < +\infty$
$\ell^p(\mathbb{Z})$	Discrete signals such that $\sum_{n=-\infty}^{+\infty} |f[n]|^p < +\infty$
$\mathbb{C}^N$	Complex signals of size N
$\mathbf{U} \oplus \mathbf{V}$	Direct sum of two vector spaces

$\mathbf{U} \otimes \mathbf{V}$	Tensor product of two vector spaces (A.19)
NullU	Null space of an operator U
ImU	Image space of an operator U

Operators

Id	Identity
$f'(t)$	Derivative $\frac{df(t)}{dt}$
$f^{(p)}(t)$	Derivative $\frac{d^p f(t)}{dt^p}$ of order p
$\vec{\nabla} f(x, y)$	Gradient vector (6.51)
$f \star g(t)$	Continuous time convolution (2.2)
$f \star g[n]$	Discrete convolution (3.33)
$f \circledast g[n]$	Circular convolution (3.73)

Transforms

$\hat{f}(\omega)$	Fourier transform (2.6), (3.39)
$\hat{f}[k]$	Discrete Fourier transform (3.49)
$Sf(u, s)$	Short-time windowed Fourier transform (4.11)
$P_S f(u, \xi)$	Spectrogram (4.12)
$Wf(u, s)$	Wavelet transform (4.31)
$P_W f(u, \xi)$	Scalogram (4.55)
$P_V f(u, \xi)$	Wigner-Ville distribution (4.120)

Probability

X	Random variable
$E\{X\}$	Expected value
$\mathcal{H}(X)$	Entropy (10.4)
$\mathcal{H}_d(X)$	Differential entropy (10.20)
$\text{Cov}(X_1, X_2)$	Covariance (A.22)
$F[n]$	Random vector
$R_F[k]$	Autocovariance of a stationary process (A.26)