Notation

Vectors, Matrices

Scalars are denoted by upper or lower case letters in italic type.

Vectors are denoted by lower case letters in boldface type, as the vector **x** made up of components x_i.

Matrices are denoted by upper case letters in boldface type, as the matrix **A** made up of elements A_{ij} (ith row, jth column).

Random Vectors (Stochastic Processes), Realizations (Samples),
and Dummy Variables

Random vectors are set in boldface sans serif type, as x made up of scalar components x_i.

Realizations of the random vector are set in boldface roman type, as **x**: $\mathbf{x}(\omega_i) = \mathbf{x}$.

Dummy variables (for arguments of density or distribution functions, integrations, etc.) are denoted by the equivalent Greek letter, such as ξ being associated with x: e.g., $f_x(\xi)$. The correspondences are (x, ξ), (y, ρ), (z, ζ), (Z, $\mathscr{Z}$).

Subscripts

a: augmented   c: continuous-time
d: discrete-time   t: true, truth model

Superscripts

^{T}: transpose (matrix) $^-$: Fourier transform
$^{-1}$: inverse (matrix) $^\wedge$: estimate
$*$: complement (set) or complex conjugate

Matrix and Vector Relationships

A > **0**:   **A** is positive definite.
A $\geq$ **0**:   **A** is positive semidefinite.
x $\leq$ **a**:   componentwise, $x_1 \leq a_1$, $x_2 \leq a_2$, ..., and $x_n \leq a_n$.

List of symbols and pages where they are defined or first used

Symbol	Page	Symbol	Page
A	60	$\mathbf{Q}$	148; 154; 155
$\mathbf{B}$	35, 36; 169	$\mathbf{Q}_d$	171
$\mathbf{B}_d$	171	$\mathbf{R}$	115; 174
$\mathbf{C}$	246; 328	$\mathbf{R}_c$	176; 257
$\mathbf{D}$	36; 332; 392	R^n	17; 37, 62
$E\{\cdot\}$	88	$\mathbf{r}$	218; 228
$E\{\cdot|\cdot\}$	95	r	35; 91
$\mathbf{e}$	117; 226; 328	r_{xy}	91
$\exp\{\cdot\}$	102	$\mathbf{S}$	370
$\mathbf{F}$	26, 36; 163	$\mathbf{s}$	228
$F_{\mathbf{x}}$	68	s	161
$F_{\mathbf{x}|\mathbf{y}}$	78	$\mathbf{T}$	28
$\mathbf{f}$	37	T	133
$f_{\mathbf{x}}$	72	t_i	42
$f_{\mathbf{x}|\mathbf{y}}$	78	$\mathbf{U}$	392
$\mathscr{F}$	61	$\mathbf{u}$	35; 169
$\mathscr{F}_{\mathbf{B}}$	62	$\mathbf{V}$	370
$\mathbf{G}$	36; 163	$\mathbf{v}$	115; 174
$\mathbf{G}_d$	172	$\mathbf{v}_c$	257
$\mathbf{H}$	35, 36; 42	$\mathbf{W}$	44
$\mathbf{h}$	26; 37; 42	$\mathbf{W}_D$	45
$\mathbf{I}$	16; 156, 161	$\mathbf{W}_{DTI}$	45
$\mathscr{I}$	240	$\mathbf{W}_{TI}$	45
J	121	$\mathbf{W}_d$	370
$\mathbf{K}$	117; 217	$\mathbf{w}$	153; 155
$\mathbf{M}$	47	$\mathbf{w}_d$	171
$\mathbf{M}_D$	47	$\mathbf{X}$	333
$\mathbf{M}_{DTI}$	48	$\mathbf{x}$	65, 66; 133; 163
$\mathbf{M}_{TI}$	47	$\hat{\mathbf{x}}(t_i^-)$	115; 209
$\mathbf{m}$	89; 136	$\hat{\mathbf{x}}(t_i^+)$	115; 207
m	35	$\hat{\mathbf{x}}(t_i^{+c})$	309; 333
n	26	$\hat{\mathbf{x}}(t/t_{i-1})$	219
$\mathbf{P}_{xx}$	90	$\mathbf{Z}$	206
$\mathbf{P}_{x|y}$	97	$\mathbf{z}$	115; 174
$\mathbf{P}_{xx}(t)$	136	$\mathbf{z}_c$	257
$\mathbf{P}_{xx}(t, t+\tau)$	136	$\mathbf{z}_i$	206
$\mathbf{P}_{xx}(\tau)$	140	$\boldsymbol{\beta}$	148; 155
$\mathbf{P}(t_i^-)$	115; 209	σ	90
$\mathbf{P}(t_i^+)$	115; 207	σ^2	90
$\mathbf{P}(t/t_{i-1})$	219	τ	40; 140
$P(A)$	60; 63	$\boldsymbol{\Phi}$	40

$\phi_\mathbf{x}$	99	$\Psi_{xx}(\tau)$	140
Ψ_{xx}	90	$\bar{\Psi}_{xx}(\omega)$	141
$\Psi_{xx}(t)$	137	Ω	60
$\Psi_{xx}(t, t + \tau)$	137	ω	60