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Notation and Symbols

$\mathbb{R}^n$	n-dimensional Euclidean space
$\mathbb{R}^+$	the nonnegative real numbers
$\mathbb{R}^{n\times m}$	the $n \times m$ matrices (real entries)
$\mathbb{Z}$	the integers
$\mathbb{N}$	the natural numbers
$\mathbf{B}_0$	the family of Borel sets $U \subset \mathbb{R}$ whose closure $\bar{U}$ does not contain 0
$\mathbb{R}^n \simeq \mathbb{R}^{n\times 1}$	i.e., vectors in $\mathbb{R}^n$ are regarded as $n \times 1$ matrices
I_n	the $n \times n$ identity matrix
A^T	the transposed of the matrix A
$\mathcal{P}(\mathbb{R}^k)$	set of functions $f : \mathbb{R}^k \to \mathbb{R}$ of at must polynomial growth, i.e., there exists constants C, m such that: $\lvert f(y)\rvert \leq C(1 + \lvert y\rvert^m)$ for all $y \in \mathbb{R}^k$
$C(U, V)$	the continuous functions from U into V
$C(U)$	the same as $C(U, \mathbb{R})$
$C_0(U)$	the functions in $C(U)$ with compact support
$C^k = C^k(U)$	the functions in $C(U, \mathbb{R})$ with continuous derivatives up to order k
$C_0^k = C_0^k(U)$	the functions in $C^k(U)$ with compact support in U
$C^{k+\alpha}$	the functions in C^k whose kth derivatives are Lipschitz continuous with exponent α
$C^{1,2}(\mathbb{R} \times \mathbb{R}^n)$	the functions $f(t, x); \mathbb{R} \times \mathbb{R}^n \to \mathbb{R}$ which are C^1 w.r.t. $t \in \mathbb{R}$ and C^2 w.r.t. $x \in \mathbb{R}^n$
$C_b(U)$	the bounded continuous functions on U
$\lvert x\rvert^2 = x^2$	$\sum_{n=1}^n x_i^2$ if $x = (x_1, \ldots, x_n)$
$x \cdot y$	the dot product $\sum_{n=1}^n x_i y_i$ if $x = (x_1, \ldots, x_n)$, $y = (y_1, \ldots, y_n)$
x^+	$\max(x, 0)$ if $x \in \mathbb{R}$
x^-	$\max(-x, 0)$ if $x \in \mathbb{R}$

$\operatorname{sign} x$	$\begin{cases} 1 & \text{if } x \geq 0 \\ -1 & \text{if } x > 0 \end{cases}$
$\sinh(x)$	hyperbolic sine of x $\left(= \frac{e^x - e^{-x}}{2}\right)$
$\cosh(x)$	hyperbolic cosine of x $\left(= \frac{e^x + e^{-x}}{2}\right)$
$\operatorname{tgh}(x)$	$\frac{\sinh(x)}{\cosh(x)}$
$s \wedge t$	the minimum of s and t $(= \min(s,t))$
$s \vee t$	the maximum of s and t $(= \max(s,t))$
δ_x	the unit point mass at x
$\operatorname{Argmax}_{u \in U} f(u)$	$\{u^* \in U; f(u^*) \geq f(u), \forall u \in U\}$
$:=$	equal to by definition
$\overline{\lim}$, $\underline{\lim}$	the same as lim inf, lim sup
$\operatorname{supp} f$	the support of the function f
∇f	the same as $Df = \left[\frac{\partial f}{\partial x_i}\right]_{i=1}^n$
∂G	the boundary of the set G
$\bar{G}$	the closure of the set G
G^0	the interior of the set G
χ_G	the indicator function of the set G; $\chi_G(x) = 1$ if $x \in G$, $\chi_G(x) = 0$ if $x \notin G$
$(\Omega, \mathcal{F}, (\mathcal{F}_t)_{t \geq 0}, P)$	filtered probability space
$\Delta\eta_t$	the jump of η_t defined by $\Delta\eta_t = \eta_t - \eta_t^-$
P	the probability law of η_t
$N(t,U)$	see (1.1.2)
$\nu(U)$	$E[N(1,U)]$ see (1.1.3)
$\|\nu\|$	the norm (total mass) of the measure ν, i.e., $\nu(\mathbb{R})$
$\tilde{N}(dt, dz)$	see (1.1.7)
$B(t)$	Brownian motion
$P \ll Q$	the measure P is absolutely continuous w.r.t. the measure Q
$P \sim Q$	P is equivalent to Q, i.e., $P \ll Q$ and $Q \ll P$
E_Q	the expectation w.r.t. the measure Q
E	the expectation w.r.t. a measure which is clear from the context (usually P)
$E[Y] = E^\mu[Y] = \int Y \, d\mu$	the expectation of the random variable Y w.r.t. the measure μ
$[X,Y]$	quadratic covariation of X and Y, see Definition 1.28
$\mathcal{T}$	set of all stopping times $\leq \tau_{\mathcal{S}}$ see (2.1.1)
τ_G	the first exit time from the set G of a process X_t : $\tau_G = \inf\{t > 0; X_t \notin G\}$
$\Delta_N Y(t)$	the jump of Y caused by the jump of N, see (5.2.2)
$\check{Y}(t^-)$	$Y(t^-) + \Delta_N Y(t)$ (see (6.1.5))
$\Delta_\xi Y(t)$	the jump of Y caused by the singular control ξ
$\Delta_\xi \phi$	see (5.2.3)

$\xi^c(t)$	continuous part of $\xi(t)$, i.e., the process obtained by removing the jumps of $\xi(t)$
π/K	the restriction of the measure π to the set K
$A = A_Y$	the generator of jump diffusion Y
$\mathcal{M}$	intervention operator, see Definition 6.1
VI	variational inequality
QVI	quasivariational inequality
HJB	Hamilton–Jacobi–Bellman equation
HJBVI	Hamilton–Jacobi–Bellman variational inequality
HJBQVI	Hamilton–Jacobi–Bellman quasivariational inequality
SDE	Stochastic differential equation
càdlàg	right continuous with left limits
càglàd	left continuous with right limits
i.i.d.	independent identically distributed
iff	if and only if
a.a., a.e., a.s.	almost all, almost everywhere, almost surely
w.r.t.	with respect to
s.t.	such that

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