Index of main notations

Chap. 1
$\Omega = \mathcal{C}(\mathbb{R}_+ \to \mathbb{R})$: the space of continuous functions from $\mathbb{R}_+$ to $\mathbb{R}$
$(X_t,\ t \geq 0)$: the set of coordinates on this space
$(\mathcal{F}_t,\ t \geq 0)$: the natural filtration of $(X_t,\ t \geq 0)$
$\mathcal{F}_\infty = \underset{t\geq 0}{\vee} \mathcal{F}_t$
$b(\mathcal{F}_t)$: the space of bounded real valued $\mathcal{F}_t$ measurable functions
$(W_x,\ x \in \mathbb{R})$: the set of Wiener measures on $(\Omega, \mathcal{F}_\infty)$
$W = W_0$
$W_x(Y)$: the expectation of the r.v. Y with respect to W_x
$(L_t^y,\ y \in \mathbb{R},\ t \geq 0)$: the bicontinuous process of local times
$(L_t := L_t^0,\ t \geq 0)$ the local time at level 0
$\big(\tau_l := \inf\{t \geq 0\ ;\ L_t > l\},\ l \geq 0\big)$: the right continuous inverse of $(L_t,\ t \geq 0)$
q : a positive Radon measure on $\mathbb{R}$
$\mathcal{I}$: the set of positive Radon measures on $\mathbb{R}$ s.t. $0 < \displaystyle\int_{-\infty}^{\infty} \big(1 + |x|\big) q(dx) < \infty$
δ_a : the Dirac measure at a
$\left(A_t^{(q)} := \displaystyle\int_0^t q(X_s)ds = \int_{\mathbb{R}} L_t^y q(dy),\ t \geq 0\right)$: the additive functional associated with q
$(W_{x,\infty}^{(q)},\ x \in \mathbb{R})$: the family of probabilities on $(\Omega, \mathcal{F}_\infty)$ obtained by Feynman-Kac penalisation
$(M_{x,s}^{(q)},\ s \geq 0)$: the martingale density of $W_{x,\infty}^{(q)}$ with respect to W_x
γ_q : a scale function
$\varphi_q, \varphi_q^{\pm}$: solutions of the Sturm-Liouville equation $\varphi'' = q\varphi$
$(\mathbf{W}_x,\ x \in \mathbb{R})$: a family of positive σ-finite measures on $(\Omega, \mathcal{F}_\infty)$
$L^1(\Omega, \mathcal{F}_\infty, \mathbf{W})$ $\big($resp. $L_+^1(\Omega, \mathcal{F}_\infty, \mathbf{W})\big)$: the Banach space of
$\mathbf{W}$-integrable r.v.'s (resp. the cone of positive and $\mathbf{W}$-integrable r.v.'s)
$\big(M_t(F),\ t \geq 0\big)$: a martingale associated with $F \in L^1(\Omega, \mathcal{F}_\infty, \mathbf{W})$
$g_a := \sup\{s \geq 0\ ;\ X_s = a\}$; $g_0 = g$
$g_a^{(t)} := \sup\{s \leq t,\ X_s = a\}$; $g_0^{(t)} = g^{(t)}$
$\sigma_a := \sup\big\{s \geq 0\ ;\ X_s \in [-a, a]\big\}$; $\sigma_{a,b} := \sup\big\{s \geq 0\ ;\ X_s \in [a, b]\big\}$
$f_Z^{(P)}$: density of the r.v. Z under P
T : a $(\mathcal{F}_t,\ t \geq 0)$ stopping time
$P_0^{(3)}$ (resp. $\widetilde{P}_0^{(3)}$) : the law of a 3-dimensional Bessel process (resp. of the opposite of a 3-dimensional Bessel process) started at 0
$P_0^{(3,\mathrm{sym})} = \dfrac{1}{2}(P_0^{(3)} + \widetilde{P}_0^{(3)})$
$W_0^{\tau_l}$: the law of a 1-dimensional Brownian motion stopped at τ_l
$\Pi_{0,0}^{(t)}$: the law of the Brownian bridge $(b_u,\ 0 \leq u \leq t)$ of length t and s.t. $b_0 = b_t = 0$
$\omega \circ \widetilde{\omega}$: the concatenation of ω and $\widetilde{\omega}$ $(\omega, \widetilde{\omega} \in \Omega)$
$\omega = (\omega_t, \omega^t)$: decomposition of ω before and after t
$\Gamma^+ = \big\{\omega \in \Omega\ ;\ X_t \underset{t\to\infty}{\longrightarrow} \infty\big\}$, $\Gamma^- = \big\{\omega \in \Omega\ ;\ X_t(\omega) \underset{t\to\infty}{\longrightarrow} -\infty\big\}$
$\mathbf{W}^+ = 1_{\Gamma^+} \cdot \mathbf{W}$, $\mathbf{W}^- = 1_{\Gamma^-} \cdot \mathbf{W}$
$W^F\big(F \in L_+^1(\Omega, \mathcal{F}_\infty, \mathbf{W})\big)$: the finite measure defined on $(\Omega, \mathcal{F}_\infty)$ by : $W^F(G) = \mathbf{W}(F \cdot G)$
$\mathcal{C}$: the class of "good" weight processes for which Brownian penalisation holds
$(\nu_x^{(q)},\ x \in \mathbb{R})$: a family of σ-finite measures associated with the additive functional $(A_t^{(q)},\ t \geq 0)$