Errata

This document contains the list of errors (with appropriate corrections) that we found after the publication of our book:

G. Fabbri, F. Gozzi and A. Święch, STOCHASTIC OPTIMAL CONTROL IN INFINITE DIMENSION: DYNAMIC PROGRAMMING AND HJB EQUATIONS, With a Contribution by M. Fuhrman and G. Tessitore, Probability Theory and Stochastic Modelling, Vol. 82, Springer, 2017.

List of errors

PREFACE

1. Page xii, end of the formula in line 3 from the top.

   REPLACE

   ...$(x)\, s$,

   BY

   ...$(x) ds$,

CHAPTER 1

1. Page 8, formula (1.2).

   REPLACE

   $\|f(t,\cdot)\|$

   BY

   $\|\rho(t,\cdot)\|$

2. Page 102, Remark 2.15, second line of (A4).

   REPLACE

   ...and $a|_{[\eta,T]}(\cdot)$...

   BY

   ...and, for every $\eta \in [t,T]$, $a_1|_{[\eta,T]}(\cdot)$...

CHAPTER 2

1. Page 121, Hypothesis 2.33 (i), first line.

   REPLACE

   "... and $l(t,x,a)$ are uniformly continuous in t on $[0,T]$, uniformly for $(x,a) \in B(0,R) \times \Lambda$ for every $R > 0$."

   BY

   ".... and $l(t,x,a)$ are continuous and uniformly continuous in (t,x) on $[0,T] \times B(0,R)$, uniformly for $a \in \Lambda$ for every $R > 0$."

2. Page 124, Theorem 2.36, third line.

   REPLACE

   "Let Hypotheses 1.125, 2.1 and 2.33-(ii)(iii) be satisfied",

   BY

   "Let Hypotheses 1.125, 2.1 and 2.33 be satisfied",

   i.e. "-(ii)(iii)" should be deleted.

3. Page 128, Hypothesis 2.40 (i), first line.

   REPLACE

   "There exist $C, N > 0$ such that ..."

   BY

   "The functions b, σ and l are continuous, $l(x,a)$ is uniformly continuous in x on $B(0,R)$, uniformly for $a \in \Lambda$ for every $R > 0$. Moreover, there exist $C, N > 0$ such that ...".

4. Page 129, formula (2.69)

   REPLACE

   $l(s, X(s), a(s))$

   BY

   $l(X(s), a(s))$

5. Page 144, the formula in line 3 from the bottom.

   REPLACE

   $...\langle Ax, Dv\rangle + F(Dv) + l_2(x)...$

   BY

   $...\langle Ax + b(x), Dv\rangle + F(Dv) + l_1(x)...$

CHAPTER 3

1. Page 195, line 15 from the bottom.

   REPLACE

   $\tilde{v}(s,y) = u\big(...$

   BY

   $\tilde{v}(s,y) = v\big(...$

2. Page 197, Definition 3.34, line 4 from the bottom.

   REPLACE

   "A locally bounded B-upper semicontinuous function u on $[0,T) \times \overline{U}$ ..."

   BY

   "A locally bounded and continuous function u on $[0,T) \times \overline{U}$ which is B-upper semicontinuous on $(0,T) \times \overline{U}$ ..."

3. Page 198, Definition 3.34, line 2 from the top.

   REPLACE

   "A locally bounded B-lower semicontinuous function u on $[0,T) \times \overline{U}$ ..."

   BY

   "A locally bounded and continuous function u on $[0,T) \times \overline{U}$ which is B-lower semicontinuous on $(0,T) \times \overline{U}$ ..."

4. Page 198, Definition 3.35, line 4 from the bottom.

   REPLACE

   "A locally bounded B-upper semicontinuous function u on $(0,T] \times \overline{U}$ ..."

   BY

   "A locally bounded and continuous function u on $(0,T] \times \overline{U}$ which is B-upper semicontinuous on $(0,T) \times \overline{U}$ ..."

5. Page 199, Definition 3.35, line 2 from the top.

   REPLACE

   "A locally bounded B-lower semicontinuous function u on $(0,T] \times \overline{U}$ ..."

   BY

   "A locally bounded and continuous function u on $(0,T] \times \overline{U}$ which is B-lower semicontinuous on $(0,T) \times \overline{U}$ ..."

6. Page 252, line 2 from the top.

   REPLACE

   $\kappa\omega(r)$

   BY

   $\kappa\omega_1(r)$

7. Page 252, line 11 from the top.

   REPLACE

   $\varphi(t,x,y) = \varphi_\delta(|x-y|_C^2+\gamma)^{\frac{1}{2}}(1+t)$

   BY

   $\varphi(t,x,y) = \varphi_\delta\left((|x-y|_C^2+\gamma)^{\frac{1}{2}}\right)(1+t)$

8. Page 255, formula (3.211).

   REPLACE

   $m_\tau(|x-y|)$

   BY

   $m_\tau(|x-y|_{-1})$

9. Page 267, second line of formula (3.253).

   REPLACE

   $X(t) = x$

   BY

   $X_n(t) = x$

10. Page 274, 4th line after (3.277).

    REPLACE

    $\dots\frac{h_r(|x|)}{|x|}\dots$

    BY

    $\dots\frac{h_r(t,|x|)}{|x|}\dots$

11. Page 305, line 5 from the bottom.

    REPLACE

    $\dots \leq 2\delta K|x_i|_{0,\rho}^2 \to 2\delta K|\bar{x}|_{0,\rho}^2$

    BY

    $\dots \leq 2K|x_i|_{0,\rho}^2 \to 2K|\bar{x}|_{0,\rho}^2$

12. Page 327, line 5 from the bottom.

    REPLACE

    $Q_N(-A)^{-\frac{\gamma}{2}}\int_0^t(-A)^{\frac{\beta+\gamma}{2}}e^{(t-s)A}(-A)^{\frac{\beta}{2}}\sigma((-A)^{\frac{\beta}{2}}Y(s),a_1(s))dW(s)$

    BY

    $Q_N(-A)^{-\frac{\gamma}{2}}\int_0^t(-A)^{\frac{\beta+\gamma}{2}}e^{(t-s)A}(-A)^{-\frac{\beta}{2}}\sigma((-A)^{\frac{\beta}{2}}Y(s),a_1(s))dW(s)$

13. Page 327, line 3 from the bottom.

    REPLACE

    $\int_0^t (-A)^{\frac{\beta}{2}} e^{(t-s)A} (-A)^{\frac{\beta}{2}} P_N[\sigma((-A)^{\frac{\beta}{2}} Y_N(s), a_1(s)) - \sigma((-A)^{\frac{\beta}{2}} Y(s), \alpha_1(s))] dW_Q(s)$

    BY

    $\int_0^t (-A)^{\frac{\beta}{2}} e^{(t-s)A} (-A)^{-\frac{\beta}{2}} P_N[\sigma((-A)^{\frac{\beta}{2}} Y_N(s), a_1(s)) - \sigma((-A)^{\frac{\beta}{2}} Y(s), \alpha_1(s))] dW_Q(s)$

CHAPTER 4

1. Page 382, line 1 from the bottom.

   REPLACE

   $|G(y(r))^{-1}G(x)h|_Y$

   BY

   $|G(y(r))^{-1}G(x)h|_Z$

2. Page 383, line 7 from the top.

   REPLACE

   $s^{-1}[\varphi(t,s) - \varphi(t,0)]$

   BY

   $s^{-1}|\varphi(t,s) - \varphi(t,0)|_Y$

3. Page 521, line 2 from the top, formula (4.254).

   REPLACE

   $UC_b(X, \mathcal{L}_1(H))$

   BY

   $UC_b(H, \mathcal{L}_1(H))$

4. Page 541, line 16 from the top.

   DELETE

   pr2:exmildOUF0spsapp

   There should be "Proposition 1.147" there.

CHAPTER 5

1. Page 619, inequality (5.22).

   REPLACE

   $\alpha\,|\mathcal{K}(x,X) - \mathcal{K}(x,Y)|_{\mathcal{H}_2^{\mu_0}(0,T;H)}$

   BY

   $\alpha\,|X - Y|_{\mathcal{H}_2^{\mu_0}(0,T;H)}$

2. Page 649, Lemma 5.46, line 6 from the bottom (the first line of the formula defining $\rho_{a(\cdot)}$).

   REPLACE

   ... $, dW_Q(r)\Big\rangle$

   BY

   ... $, Q^{-1/2} dW_Q(r)\Big\rangle$

3. Page 650, line 3 from the bottom.

   REPLACE

   ... $, dW_Q(r)\Big\rangle$

   BY

   ... $, Q^{-1/2} dW_Q(r)\Big\rangle$

4. Page 650, line 1 from the bottom.

   REPLACE

   ... $, dW_Q(r)\Big\rangle$

   BY

   ... $, Q^{-1/2} dW_Q(r)\Big\rangle$

5. Page 657, line 14 from the top (the second line of the three line formula).

   REPLACE

   $$\left| \int_t^s e^{(t-r)A} (R(r, X_n(r), a_n(r)) - R(r, X(r), a(r))) dr \right|$$

   BY

   $$\left| \int_t^s e^{(t-r)A} Q^{1/2} (R(r, X_n(r), a_n(r)) - R(r, X(r), a(r))) dr \right|$$

APPENDIX B

1. Page 837, line 4.

   REPLACE

   ...$(\lambda I - \mathcal{A}^m)(D(\mathcal{A}_0))$...

   BY

   ...$(\lambda I - \mathcal{A}^m)^{-1}(D(\mathcal{A}_0))$...

APPENDIX C

1. Page 851.

   REPLACE THE FIRST TWO LINES OF SECTION C.4 BY THE FOLLOWING:

   Let, as in Section C.2, $H = L^2(\mathcal{O})$ and $\Lambda = L^2(\partial\mathcal{O})$. Let $\Xi = \Lambda$, $Q \in \mathcal{L}^+(\Xi)$, and let $\left(\Omega, \mathcal{F}, \{\mathcal{F}_s^t\}_{s\in[t,T]}, \mathbb{P}, W_Q\right)$ be a generalized reference probability space. We consider the following problem:

2. Second line of formula (C.34).

   REPLACE

   ...$= h(s, y(s,\xi))$...

   BY

   ...$= h(s,\xi)$...

3. Page 851, first line after formula (C.34).

   REPLACE

   ...where $f, h : [t,T] \times \mathbb{R} \times \Omega \to \mathbb{R}$ and $g : [t,T] \times \partial\mathcal{O} \times \Omega \to \mathbb{R}$ are...

   BY

   ...where $f : [t,T] \times \mathbb{R} \times \Omega \to \mathbb{R}$ and $h, g : [t,T] \times \partial\mathcal{O} \times \Omega \to \mathbb{R}$ are...

4. Page 851, last two lines before formula (C.35).

   REPLACE

   So, defining as before $b(s,y)(\cdot) := f(s,y(\cdot))$ and $[\sigma(s,y)z](\cdot) := h(s,y(\cdot))z(\cdot)$, we define the mild form of (C.34), for $s \in [t,T]$, as

   BY

   We now define, as in Sections C.2 and C.3, $b(s,y)(\cdot) := f(s,y(\cdot))$ for $s \in [t,T]$ and $y \in H$. Moreover we define $\sigma : [t,T] \to \mathcal{L}(\Lambda)$ as follows: for $s \in [t,T]$ and $z \in \Lambda$, $[\sigma(s)z](\cdot) := h(s,\cdot)z(\cdot)$. We define the mild form of (C.34), for $s \in [t,T]$, as

5. Last line of formula (C.35).

   REPLACE

   ...$G_N(\sigma(r, X(r))dW_Q(r)$...

   BY

   ...$G_N\sigma(r)dW_Q(r)$...

6. Second line of formula (C.36).

   REPLACE

   ...$N_\lambda\sigma(s, X(s))dW_Q(s)$...

   BY

   ...$N_\lambda\sigma(s)dW_Q(s)$...

7. Page 852, the formula in the third line of Section C.5.

   REPLACE

   $...G_D\sigma(r, X(r))dW_Q(r)...$

   BY

   $...G_D\sigma(r)dW_Q(r)...$

8. Page 852, formula (C.37).

   REPLACE

   $...h(s, (y(t, 0))...$

   BY

   $...h(s)...$

9. Page 853, last line of formula (C.38).

   REPLACE

   $...G_\eta\sigma(r, X(r))dW_Q(r)...$

   BY

   $...G_\eta\sigma(r)dW(r)...$

10. Page 853, second line of formula (C.39).

    REPLACE

    $...G_\eta\sigma(r, X(r))dW_Q(r)...$

    BY

    $...G_\eta\sigma(r)dW(r)...$

11. Page 853, the last line before formula (C.39) and the third line of formula (C.39).

    REPLACE

    $L^2(t, T; \mathbb{R})$

    BY

    L^2_η

APPENDIX D

1. Page 859, line 4 of Theorem D.20.

   REPLACE

   $f(b) - f(a)$

   BY

   $|f(b) - f(a)|_Y$

2. Page 859, line 5 of Theorem D.20.

   REPLACE

   $f(b) - f(a) - (b - a)f'(t_0)$

   BY

   $|f(b) - f(a) - (b - a)f'(t_0)|_Y$

REFERENCES

1. Page 891, Reference 391.

   REPLACE

   Gaussian Measures in Hilbert Dpaces

   BY

   Gaussian Measures in Banach Spaces