Monte Carlo Method, Random Number, and Pseudorandom Number — List of Errata (2016.09.01) *

Hiroshi SUGITA

- p.2 line 5 from bottom: $F(S\,;t) \implies F(S\,;x)$
- p.3 line 10: $\mathbb{T} \implies \mathbb{T}^1$
- p.7 line 2 from bottom: $lK \in l\,\mathbb{N}^+ \implies lK \in K\,\mathbb{N}^+$
- p.27 line 2 from bottom: *(v) There exists a partial recursive* $\implies$ *(v) There exists a total recursive*
- p.28 line 20:

$$U = \{\, u \in \mathbb{N} \mid \exists\, z \text{ s.t. } q'(u,z) = 0\,\}. \implies U = \{\, z \in \mathbb{N} \mid \exists\, u \text{ s.t. } q'(u,z) = 0\,\}.$$

- p.28 line 22: it is a partial recursive $\implies$ it is a total recursive
- p.32 line 10 from bottom: Delete " If z is a Gödel number, then ".
- p.33 lines 7 to 10: The proof of Theorem 3.16 is not valid for $x = 0$. The following modification makes it valid for $x = 0$.

$$\begin{aligned} g'(t,x,p,y,z) &:= \begin{cases} g(p,y,z) & (\,z < t\,), \\ x+1 & (\,z \geq t\,), \end{cases} \\ A(t,x,p,y) &:= g'(t,x,p,y,\mu_{z<t}(q(p,y,z))). \end{aligned}$$

Then $A(t,x,p,y)$ is also a primitive recursive function. Finally define

$$K'(t,x,y) := \min\left(\{\, L(p) \mid p \in \mathbb{N},\ L(p) < L(x) + c,\ \ A(t,x,p,y) = x\,\} \cup \{L(x)+c\}\right),$$

- p.35 line 2: Delete " For each $t \in \mathbb{N}$ ".
- p.36 line 5:

$$\begin{aligned} U &:= \{(m,x) \mid K(x|L(x)) < L(x) - m\} \\ &\implies \\ U &:= \{(m,x) \mid K(x|L(x)) < L(x) - m\} \cup \{(0,0)\}. \end{aligned}$$

- p.37 line 2: Delete " less than ".

* The newest list is at `http://www.math.sci.osaka-u.ac.jp/~sugita/mcm_E.html`

- p.39 line 3 from bottom: $\ldots \mid x \in U_m \}, \quad \Longrightarrow \quad \ldots \mid C(x) \subset U_m \},$
- p.49 line 1 from bottom: $\leq \quad \Longrightarrow \quad <$
- p.50 lines 3–5:

$$\Longrightarrow$$

$$\begin{aligned}
&\leq \sum_{n=0}^{2^{j_1}-1} \mathbb{P}\left(\lfloor \bullet + n\alpha \rfloor_m \neq \lfloor \lfloor \bullet \rfloor_{m+j} + n\lfloor \alpha \rfloor_{m+j} \rfloor_m\right) \\
&< \sum_{n=0}^{2^{j_1}-1} (n+1)2^{-j} \\
&= \frac{(2^{j_1}+1)2^{j_1}}{2} \cdot 2^{-j} < 2^{-(j-2j_1)}.
\end{aligned}$$

- p.55 line 1: $\sqrt{N}/4 \quad \Longrightarrow \quad 1/\left(4\sqrt{N}\right)$
- p.62 line 3: s should be replaced by another letter, say t ;

$$\Longrightarrow$$

$$C_j \ := \ \bigcup_{t=1}^{2^m} \left[\frac{t}{2^m} - \frac{\beta^{(m)}_{\sigma(m,j)}}{2^m}, \ \frac{t}{2^m} - \frac{\beta^{(m)}_{\sigma(m,j+1)}}{2^m} \right), \quad j = 0, 1, \ldots, l-1,$$

- p.71 lines 6, 10: $\max\limits_{1 \leq s \leq l-1} \quad \Longrightarrow \quad \max\limits_{0 \leq s \leq l-1}$
- p.72 lines 11 – 15:

$$\Longrightarrow$$

$$\begin{aligned}
\max_{0 \leq s \leq l-1} \left| A(\boldsymbol{\alpha}^{(m_n+r),s}) \right| &\leq \left(1 - \frac{1}{2^{r+1}}\right) \max_{0 \leq s \leq l-1} \left| A(\boldsymbol{\alpha}^{(m_n-2),s}) \right| \\
&\leq \left(1 - \frac{1}{2^{r+1}}\right) \max_{0 \leq s \leq l-1} \left| A(\boldsymbol{\alpha}^{(m_{n-1}+r),s}) \right| \\
&\leq \left(1 - \frac{1}{2^{r+1}}\right)^2 \max_{0 \leq s \leq l-1} \left| A(\boldsymbol{\alpha}^{(m_{n-2}+r),s}) \right| \\
&\leq \cdots\cdots\cdots \\
&\leq \left(1 - \frac{1}{2^{r+1}}\right)^n \max_{0 \leq s \leq l-1} \left| A(\boldsymbol{\alpha}^{(m_0+r),s}) \right| \\
&\leq \left(1 - \frac{1}{2^{r+1}}\right)^n \longrightarrow 0, \qquad n \to \infty.
\end{aligned}$$

- p.85 lines 5 from bottom: $L^2(\mathcal{B}_m) \quad \Longrightarrow \quad L^2(\mathcal{B}_m) := L^2(\mathbb{T}^1, \mathcal{B}_m, \mathbb{P})$
- p.89 line 6 from bottom; p.90 line 11 from bottom: $\sqrt{\mathbf{V}(F - F_M)} \quad \Longrightarrow \quad \sqrt{\mathbf{V}[F - F_M]}$

- p.96 lines 4, 5, from bottom: $a_n, \Big) \quad \Longrightarrow \quad a_n \Big)$
- p.106 line 6 from bottom: $(b-a)Z_{\tau(x)-1}(x)+b \quad \Longrightarrow \quad (b-a)Z_{\tau(x)-1}(x)+a$
- p.107 line 7 from bottom — p.108 line 9 from bottom: $q_1 \quad \Longrightarrow \quad q_2$
- p.108 line 11 from bottom: $N \geq N_1 \quad \Longrightarrow \quad N \geq \max(N_0, N_1)$
- p.109 line 11: $B \quad \Longrightarrow \quad B'$
- p.109 lines 6 — 20: $q_l \quad \Longrightarrow \quad q_{l+1}$
- p.109 line 7 from botom: $N \geq N_3 \quad \Longrightarrow \quad N \geq \max(N_2, N_3)$
- p.113 lines 14, 17 : `xch[M_PLUS_J], ach[M_PLUS_J]` $\Longrightarrow$ `xch[], ach[]`
- p.122 line 12 from bottom: `sum_of_w=0` $\Longrightarrow$ `sum_of_f=0`
- p.123 line 11 from bottom: $W \quad \Longrightarrow \quad f$
- p.123 line 9 from bottom:

  `sum_of_w/SAMPLE_SIZE` $\Longrightarrow$ `sum_of_f/SAMPLE_SIZE`

- p.128 line 9 from bottom:

  Inform. Control, **7** $\Longrightarrow$ *Inform. Control*, **9**

- p.129 line 7 from bottom:

  `http://hmepage.mac.com/hiroshi_sugita/mathematics.html`

  $\Longrightarrow$

  `http://www.math.sci.osaka-u.ac.jp/~sugita/mathematics.html`

- p.131: $E^{(m)}(k_0, \ldots, k_{l-1}; \alpha) \cdots\cdots 58 \quad \Longrightarrow \quad E^{(m)}(k_0, \ldots, k_{l-1}; \alpha) \cdots\cdots 57$
- p.131: $\delta_{f,A}(n), \quad \tilde{\delta}_{f,\tilde{A}}(n) \quad \Longrightarrow \quad \delta_{g,A}(n), \quad \tilde{\delta}_{g,\tilde{A}}(n)$
- p.131: $S_{f,A}(n), \quad \tilde{S}_{f,\tilde{A}}(n) \quad \Longrightarrow \quad S_{g,A}(n), \quad \tilde{S}_{g,\tilde{A}}(n)$
- p.132: distribution function $\cdots\cdots 45$ $\Longrightarrow$ distribution function $\cdots\cdots 2, 45$
- p.132:

  pairwise independent $\cdots\cdots 18, 20,$ $\Longrightarrow$ pairwise independent $\cdots\cdots 17, 20,$

- p.132:

  pseudorandom number $\cdots\cdots 14$ $\Longrightarrow$ pseudorandom number $\cdots\cdots 10, 14, 44$

- p.132: partial — function $\cdots\cdots 23$ $\Longrightarrow$ partial — function $\cdots\cdots 23, 24$