Errata to Infinite Words (October 2021)

- page 15, line 14:

  containing the finite subsets of A^∞

  should be

  containing the finite subsets of A^*

  (Wolfgang Thomas, March 2009).

- page 17, lines 11–13: q_{n+1} should be q_n (Goutam Biswas, June 2007).

- page 18, add the definition of the minimal deterministic automaton of a set of finite words: it is the deterministic automaton $\mathcal{A} = (Q, A, E, i, T)$ where Q is the set of nonempty classes of the *Nerode equivalence*, defined for $u, v \in A^*$ by $u \sim v$ if for all $w \in A^*$, one has $uw \in X \Leftrightarrow vw \in X$. The initial state i is the class of the empty word and a state q is terminal if all its elements are in X. Finally, for every $u \in A^*$ and $a \in A$, there is an edge labeled a from the class of u to the class of ua.

- page 29, Figure 5.5: $f = i' = f \to f = i' = f'$

- page 42, line -7: the set $L^\omega(\mathcal{A}) \to$ the set $X = L^\omega(\mathcal{A})$

- page 45, line -10: Consider a Büchi automaton → Consider a finite Büchi automaton

- page 46, line 2: i should be I (Goutam Biswas, July 2007).

- page 61, Proposition I.10.1: delete 'and conversely'. There is no polynomial bound for the size of a regular expression for the set recognized by a Büchi automaton. Change also the label of the corresponding arrow in Figure 10.1 to 'Exp'.

  page 62: Proposition I.10.2 is consequently false. Suppress subsection 10.2 and modify the arrow on Figure 10.1 to 'Exp'.

  (Thomas Wilke, January 2005. See his review in *Bull. Symbolic Logic*, **11**, 2005, p. 246).

- page 62, line -3: is a function from Q onto $T \to$ is a partial function from Q onto T

- page 63, line 6: the number of surjective functions → the number of injective functions

  line 8: the number of surjective functions S_k from Q to a k element set by n^{k+1}. →

  the number S_k of partial surjective functions from Q to a k element set by the total number of partial functions from Q to a k element set which is $(k+1)^n$. (Olivier Carton, 2017).

line 10: change the inequality by

$$\begin{aligned}\mathrm{Card}(\mathcal{T}_n) &\leq \sum_{1\leq k\leq n} C_k I_k S_k 2^k \leq n C_n I_n S_n 2^n \\ &\leq n\frac{(2n-2)!}{n!(n-1)!}\frac{(2n)!}{n!}(n+1)^n 2^n \\ &\leq \frac{(2n-2)!}{(n-1)!^2}\frac{(2n)!}{n!^2}(n-1)!(n+1)^{n+1}2^n\end{aligned}$$

and line 12 by

$$\ln(\mathrm{Card}(\mathcal{T}_n)) \leq (2n-1)\ln 4 + \ln((n-1)!) + (n+1)\ln(n+1) + n\ln 2$$

- page 106, line -1: change $0 \leq i \leq n-1$ to $0 \leq i$. (Christian Coffrut, february 2019).
- page 123, add Example: Figure 10.1 represents a prophetic automaton recognizing the set of words on $\{a, b\}$ with an infinite number of occurrences of b.
- page 147, in the proof of Proposition 3.7, (2) implies (4). Let $\mathcal{A} = (Q, A, \cdot, i, Q)$ be a trim deterministic Büchi automaton, in which each state is final, recognizing X.

  (4) implies (2). Since P is prefix-closed, and since from each state of the minimal automaton there is a path leading to F, one has $F = Q$ and hence $X = L^\omega(\mathcal{A})$ by Proposition 6.1. (Stefan Hoffman, 2016).
- page 154, lines -1 and -2: delete Formulas (4) and (5) (Olivier Carton, november 2007)
- page 156, line 2: $(y, x) \in A^\omega \times E\ \cdots \to \{(y, x) \in A^\omega \times E\ \cdots$ (Christian Choffrut, October 2008)
- page 185, line -4: Theorem 4.4 is, according to Moschovakis, ... $\to$ Theorem 7.4 is, according to Moschovakis, ... (Christian Choffrut, April 2020)
- page 205, Figure 4.8: A Muler automaton. $\to$ A Muller automaton.
- page 318, line 11, $\varphi(<_1) = \varphi(w_1)e \to \varphi(w_1) = \varphi(w_1)e$
- page 425, proof of Theorem X.3.7. The argument for the second and third case are inaccurate. To reestablish a correct one, start the proof with a Rabin automaton instead of a Muller automaton.

  For the second case, the new automaton $\mathcal{A}_1$ is obtained by removing all transitions from state q different from (q, q, q).

  For the third case, choose a path π_0 such that the set $\mathrm{Inf}(\pi_0)$ is the set of live states. Since r is successful, there is a pair (L, R) such that $\mathrm{Inf}(\pi_0) \cap L = \emptyset$ and $\mathrm{Inf}(\pi_0) \cap R \neq \emptyset$.

Choose a state q in $\mathrm{Inf}(\pi_0) \cap R$. We build a rational run $r_1 \cdot_q r_2^{\omega,q}$ as follows. The run r_1 is build as in the second case above. The run r_2 is build by choosing q as initial state and by making it nonlive when revisited the first time. One can verify that this run is successful. In particular, if π is a path where q appears infinitely often the pair (L, U) is appropriate. (Alexander Rabinovich, December 2006)

- p. 515, line 8, reference 265: Büchi automata

  line 12, reference 266: μ-calculus