Errata

Correction to "Reduced Length Checking Sequences"

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Index Terms—Finite State Machine, checking sequence, test minimization, distinguishing sequence.

THE paper [1] describes improvements on the algorithm from [2], which produces a checking sequence from a finite state machine M that has a known distinguishing sequence D. However, while the improvements described in [1] are valid, the final step of the checking sequence generation algorithm was not included and we outline this step here.

The algorithm in [1] produces a directed graph G and then generates a tour $\mathcal{T}$ of G such that $\mathcal{T}$ contains certain edges. Checking sequence generation is thus represented in terms of the rural Chinese postman problem. The checking sequence is produced by starting $\mathcal{T}$ at vertex v_1. However, in contrast to [2], in doing this we may fail to check the final transition in the tour and, if this is the case, then we need to add a distinguishing sequence to the end of the sequence produced by [1]. We can thus produce a checking sequence from $\mathcal{T}$ in the following way: We choose an edge e from $\mathcal{T}$ such that e represents a transition test for a transition τ that ends at the initial state s_1 of M. We replace e by the corresponding sequence $e_1, \ldots, e_k$ of edges from G to form a tour $\mathcal{T}'$. Let P denote a walk produced by starting $\mathcal{T}'$ with e_2 and let Q be the label of P. We return the input/output sequence $QD/\lambda(s_1, D)$ that forms our checking sequence.

Although both [1] and [2] correctly state that the algorithm of [2] should start a tour at the vertex v_1, instead, in the examples, [1] started it at v_1'. As a result, [1] did not apply the algorithm of [2] correctly to the example and should have given the checking sequence

$$a/x, a/x, \alpha_1, L_{452}, L_{212}, L_{252}, a/x, b/y, \alpha_2, T_2, L_{441}, L_{124}, b/x, L_{531}, L_{112}, T_2, b/x, L_{512}, T_2, b/x, b/y, L_{352}, T_2, b/x, b/y, L_{341}.$$

The corrected algorithm of [1] returns the checking sequence

$$D/\lambda(s_1, D), b/y, D/\lambda(s_1, D), a/x, \alpha_1', a/x, D/\lambda(s_4, D), a/x, D/\lambda(s_2, D), b/x, D/\lambda(s_5, D), a/x, b/y, \alpha_2', a/x, a/y, D/\lambda(s_1, D), a/x, b/y, b/x, D/\lambda(s_5, D), a/x, b/y, a/y, D/\lambda(s_4, D), b/y, D/\lambda(s_1, D)$$

of length 64 (rather than one of length 61 reported).

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