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CORRIGENDUM

ELECTION IN A COMPLETE NETWORK WITH A SENSE OF DIRECTION

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Lisa Higham of the University of British Columbia has pointed out a subtle error in the algorithm presented in our paper [1].

Suppose the *id*'s 1, 2,..., N are placed in increasing order around the ring formed by taking link number 1 at each processor. Higham constructed the following execution of our algorithm that uses $4N$ messages:

(1) Each processor sends its *id* to its neighbor at distance 1.
(2) Processor 1 receives *id* N, and processor 2 receives *id* 1.
(3) Processor 1 receives *id* 2 and forwards it to processor N.
(4) Processor 2 receives *id* N, and processor 3 receives *id* 2.
(5) Processor 2 receives *id* 3 and forwards it to processor N.

This execution continues, with four transmitted messages for each processor that becomes passive.

We can correct the algorithm to achieve $3.62N$ messages, as claimed in our paper, by forcing the algorithm to operate in phases. Simply include the phase number in each message, and modify the RECEIVE procedure to deliver messages in order of increasing phase number; processors buffer messages with phase numbers greater than the phase number expected. The analysis in our paper applies to this corrected algorithm.

There was also a mistake in the last statement of the original algorithm, which was

SEND$(N-D; N-(D+E), Newid)$.

This statement should be replaced by

SEND$(N-D; N-D+E, Newid)$,

where the expression $N-D+E$ is interpreted modulo N.

Reference

[1] M.C. Loui, T.A. Matsushita and D.B. West, Election in a complete network with a sense of direction, *Inform. Process. Lett.* **22** (4) (1986) 185–187.