

A FAST PARALLEL EDGE-COLORING EXTENSION ALGORITHM

LANDON RABERN

ABSTRACT. Let G be a simple graph with n vertices and maximum degree Δ . For $k \geq \Delta + 1$, Liang, Shen and Hu [1] considered the problem of extending a k -edge-coloring of $G - v$, for some vertex v , to a k -edge-coloring of G . They propose an algorithm that runs on a CRCW PRAM in time $\mathcal{O}(\Delta^{\frac{3}{2}} \log^3(\Delta) + \Delta \log(n))$ time using $\mathcal{O}(\max\{n\Delta, \Delta^3\})$ processors. We give a faster algorithm that runs on a CREW PRAM in $\mathcal{O}(\log(\Delta) \log(n))$ time using $\mathcal{O}(n\Delta)$ processors. In particular, this shows that the edge-coloring extension problem is in FNC.

REFERENCES

- [1] Weifa Liang, Xiaojun Shen, and Qing Hu. Parallel algorithms for the edge-coloring and edge-coloring update problems. *Journal of Parallel and Distributed Computing*, 32(1):66–73, 1996.