Jendrol’, Stanislav

Facial rainbow edge-coloring of plane graphs.  (English) Zbl 1403.05048
Graphs Comb. 34, No. 4, 669-676 (2018).

In this note, the author introduces a facial rainbow edge-coloring of a loopless connected plane graph $G$, which is an edge-coloring of $G$ such that two distinct edges receive distinct colors if they lie on a common facial path of $G$. The minimum number of colors in such a coloring is called the facial rainbow edge number of $G$ and is denoted by $erb(G)$. Let $G$ be a loopless connected plane graph and let $L(G)$ be the length of the longest facial path of $G$. The author proves that $erb(G) \leq \lceil \frac{3}{2}(L(G) + 1) \rceil$ for all connected loopless plane graphs (this bound is tight). For the family of all 3-connected plane graphs, this bound is improved to $L(G) + 2$. For trees, $erb(G) \leq \lceil \frac{3}{2}L(G) \rceil$ holds (which is also tight), and if $G$ is a tree with $L(G) \geq 7$ and without vertices of degree two, then $erb(G) = L(G)$.

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MSC:

05C15 Coloring of graphs and hypergraphs
05C10 Planar graphs; geometric and topological aspects of graph theory
05C40 Connectivity

Keywords: cyclic coloring; rainbow coloring; plane graphs

Full Text: DOI

References:


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