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Taking a detour; or, Gioan's theorem, and pseudolinear drawings of complete graphs.  
(English)  

Summary: We describe a uniform approach to two known graph drawing results including E. Gioan's theorem [Lect. Notes Comput. Sci. 3787, 139–150 (2005; Zbl 1171.05323)], stating that any two good drawings of a complete graph with the same rotation system are isomorphic up to Reidemeister moves of type 3, and a characterization of pseudolinear drawings of the complete graph via an excluded configuration: a bad $K_4$. Our approach yields a new and short self-contained proof of Gioan’s theorem [loc. cit.], and a short proof of the pseudolinearity characterization using a previous result. As a bonus we obtain an extension of Gioan’s theorem $E$. Gioan to the family of graphs $K_n - M$, where $M$ is a non-perfect matching in $K_n$, $n \geq 5$.

MSC:  
05C62 Graph representations (geometric and intersection representations, etc.)  
05C10 Planar graphs; geometric and topological aspects of graph theory  
52C30 Planar arrangements of lines and pseudolines (aspects of discrete geometry)

Keywords:  
Gioan’s theorem; pseudolinearity; Reidemeister moves; complete graphs; graph drawing

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References:


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