

1133-05-144

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Colchester, VT 05439, and **Mark Ellingham**. *Graph embedding and the complexity of the DNA  
reporter strand problem.*

In 2009, Jonoska, Seeman, and Wu showed that every graph admits a route for a DNA scaffolding strand, that is, a closed walk covering every edge either one or two times, in opposite directions if two times. This corresponds to showing that every graph has an orientable embedding with at least one face that is incident with every edge. In the context of the original application, the desired object is such a closed walk of minimum length. Here we give a very short proof of the original result, but more critically, prove that finding a shortest length solution is NP-Hard, even in the special case of 3-regular, 3-connected, planar graphs. Independent of the motivating application, this problem opens a new direction in the study of graph embeddings, and we suggest several new problems emerging from it. (Received July 21, 2017)