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Jonathan L. Gross* (gross@cs.columbia.edu). *Embeddings for Bounded Treewidth and Bounded Degree.*

Let \mathcal{F} be any family of graphs of bounded treewidth and bounded degree. We construct a quadratic-time algorithm for calculating the genus distribution of the graphs in \mathcal{F} , that is, for the number of cellular embeddings in each orientable surface from minimum to maximum genus of G . For a given graph G with decomposition tree T , we first calculate a *partitioned genus distribution* for each subgraph induced on the vertices in a node of T , and we reassemble the graph G by iteratively amalgamating these subgraphs. With each amalgamation step, we calculate a partitioned genus distribution of the subgraph of G resulting from the amalgamation. Since the number of non-zero values in the genus distribution grows quadratically with the number of vertices, quadratic-time is unimprovable. This result for genus distribution complements an algorithm of Kawarabayashi, Mohar, and Reed for calculating the minimum genus of a graph of bounded treewidth in linear time. (Received September 20, 2011)