

# Bled'11 - 7th Slovenian International Conference on Graph Theory

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## Embeddings of Cubic Halin Graphs: A Surface-by-Surface Inventory

### Content :

We derive an  $O(n^2)$ -time algorithm for calculating the sequence of numbers  $g_0(G)$ ,  $g_1(G)$ ,  $g_2(G)$ , ... of distinct ways to embed a  $\text{hbox}\{3\text{-regular}\}$   $\text{Halin graph}$   $G$  on the respective orientable surfaces  $S_0$ ,  $S_1$ ,  $S_2$ , ... . Key topological features are a  $\text{quadrangular decomposition}$  of plane Halin graphs and a new  $\text{recombinant-strands}$  reassembly process that fits pieces together three-at-a-vertex. Key algorithmic features are reassembly along a  $\text{post-order traversal}$ , with just-in-time  $\text{dynamic assignment of roots}$  for quadrangular pieces encountered along the tour.

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