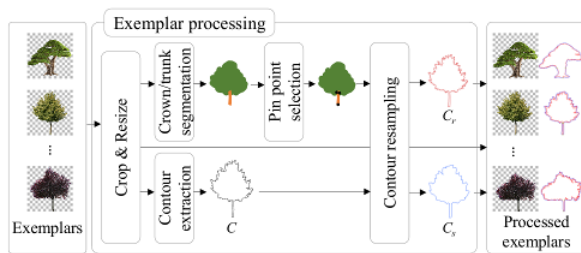


# Image-Based Tree Variations

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The automatic generation of realistic vegetation closely reproducing the appearance of specific plant species is still a challenging topic in computer graphics. In this paper, we present a new approach to generate new tree models from a small collection of frontal RGBA images of trees. The new models are represented either as single billboards (suitable for still image generation in areas such as architecture rendering) or as billboard clouds (providing parallax effects in interactive applications). Key ingredients of our method include the synthesis of new contours through convex combinations of exemplar

countours, the automatic segmentation into crown/trunk classes and the transfer of RGBA colour from the exemplar images to the synthetic target. We also describe a fully automatic approach to convert a single tree image into a billboard cloud by extracting superpixels and distributing them inside a silhouette defined 3D volume. Our algorithm allows for the automatic generation of an arbitrary number of tree variations from minimal input, and thus provides a fast solution to add vegetation variety in outdoor scenes.