

# PlantToon - drawing and pruning fruit trees

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## Abstract

Computer 3D drawing is a task which is performed in a number of different ways, as different are to-date the attempts to grasp the complexity of such a task. Using application programs as 3DStudio, Blender, Sketchup, it is possible to see that the time to familiarize with the environment and to learn basic capabilities range from some days to months. Most of these difficulties are due to the fact that the user should face a new dimension and develop the ability to develop a 3D perception in basically 2D environment.

PlantToon is a project coming from prior experience software born to edit and navigate plant scanned by a digitizing-arm (Magnanini et al., 1998). The present version also allows to import digitized trees, but its main objective is to teach pruning techniques, so it should allow for drawing a plant easily from scratch and let the user cut and remove branches realistically.

Expert pruners have been consulted during the development of PlantToon, obtaining suggestions used to build a plant-drawing oriented 3D-CAD tool with peculiar innovations getting them the ability to draw a plant from scratch in few time.

PlantToon uses a single canvas the 3D structure of the plant, and a new technique of navigation.

A tool palette allows to add, delete, move, select objects: trunk, primary and secondary branches, shoots, twigs, suckers, and more are added gradually according to a hierarchical organization.

The so obtained topological structure, together with the rendered 3D graphics is easy to be navigate, allowing a user to orient Pruning to information as age, number of buds or fruit charge.

The 3D rendering offers the opportunity to move the users-view as in the field, having the plant in the center of the scene and pruner with the possibility to move on its stairs.

The view is also given an optional stereoscopic view using the anaglyph technique so as to give the pruner get inside the scene with common blu-red spectacles.

PlantToon is particularly addressed to draw fruit trees in their dormant state: foliage is not considered in the present version, both because of the problems leaves make to read branch structure, and because pruning usually is performed in period with no foliage.

Future developments are exporting PlantToon artifacts into formats so as to let the plants be exchanged via the Internet or be read from simulation programs.

PlantToon has been written in VB6 (under MS-Windows) and is available as a demo form author.

## Bibliography

Magnanini E., Corelli Grappardelli L., Carboni F., An innovative methodology to digitize tree canopy – Atti IV Giornate Scientifiche SOI, Sanremo, Italy, 1-3 apr 1998, 537-538. Lang. Italian