

A Model of Leaves Classification and Weight Evaluation¹

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Abstract

In biology perspective, shapes of a trees leaves are a response to both own genetic factor and ecosystems limiting factor ; all these two factors will be revealed on trees feature attribute. This article focuses on the view of leafs diversity, mainly from trees general feature perspective (trees rest energy, distribution of leaves and branches, trees profile). By using Woods SunScan canopy analysis equations and reverse calculation of beers law, on the basis of Campbells study, we obtain the quantitative relation between the leaves shape and the trees optimization structure factor. Then we fit the obtained data matrixes by using Gaussian Fitting method. According to the graph theory analysis, shapes are divided into three categories. Furthermore, we valid the model results by fitting the representative 48 kinds samples through Smooth spline function . For a trees total leaves weight calculation, on the basis of previous research, we derive and publish a quantitative relation formula between leafs weight and several control factors (crowns DBH, height, profile etc.). Then through sensitive analyzing of the result with the data collected from practical situation, the possibility of this model is proved.

Keywords: genetic factor, graph theory analysis, height, Weight Evaluation, optimization structure factor

1. Introduction

234 x*2222 Trees, the most beautiful and useful products of the nature on earth are mostly defined as a woody plant that has many secondary branches supported clear of the ground on a single main stem or trunk with clear apical dominance[1]. Trees come in various shapes and sizes but all have the same basic structure [2]. A tree consists of five main components: roots, trunk, branches, leaves and reproductive parts (flowers and fruits or cones) (figure. 1). For the portion of the tree above the ground, trunk, branches and leaves contribute most part. Trees are an extremely important component of the natural landscape and play a decisive role in producing oxygen and reducing carbon dioxide in the atmosphere. Some of the descriptive characteristic variables are shown as below (figure.2)

2. Notations and Assumptions

2.1. Basic Terms and Variables

2.2. Model Assumptions

3. The Model

$$\{x : x^2 + 2x + 1 = 0\}$$

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4. Validation of the model

5. Discussion of the Model Result

6. Conclusions

7. The letter to the science magazine

Dear editor:

We are very glad to have the privileges to introduce our research results about our groups view in the classifying of the leaves and the calculation of the leaves mass.

According to the Preliminary analysis, we establish a model, define the energy E_p as the final residual energy of the leaves.

We set $E_p = E_o \cdot h$. where,

$$\begin{array}{ccccc}
 (X, \tau) & \xrightarrow{p^0} & (p(X), \tau|_{p(X)}) & \xrightarrow{j_{p(X)}} & (X, \tau) \\
 & \searrow f=\varphi \circ p^0 & \downarrow \varphi & \uparrow \varphi^{-1} & \nearrow j=j_{p(X)} \circ \varphi^{-1} \\
 & & (Y, \eta) & &
 \end{array}$$

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