

# COMPUTER AIDED TDT PROCESSING

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## GENERALITIES

During last two decades, the computer aided processing of medical imagery has undergone a spectacular development. There are two main categories of procedures: *a. image correction & enhancement*, *b. feature extraction & parameters measurement*.

Psychological investigations are grouped in two main classes: Objective tests based on a multiple choice quiz and Projective tests based on free drawings of a required theme.

The projective tests are used to investigate hidden personality features. They were elaborated in order to let a patient respond to ambiguous stimuli, disclosing his unseen emotions and internal conflicts. The TDT image is examined in terms of:

**Morphological analysis** – emphasizes the drawing's quality and distinctive features. (e.g. if the pressure on the pencil was high or low, if many erasures were done, if the ground & roots are present in the sketch, if the crown is figured as a simple ellipse or as a crowd of branches with just a few leaves etc.);

**Structural analysis** concentrates over the ratios computed from direct measurements of size and position (e.g. the position of the tree on the A4 paper its slant, the its main parts' dimensions etc.)

The rectangle framing the tree can be detected. (Figure 2) In order to realize this, it was marked on each row  $x_{min}$  and  $x_{max}$ , representing the first and respectively the last pixel on the row different from the background. The same operation is done on every column, thus  $y_{min}$  and  $y_{max}$  represent the first and respectively last black pixel in the column.

## CONCLUDING REMARKS

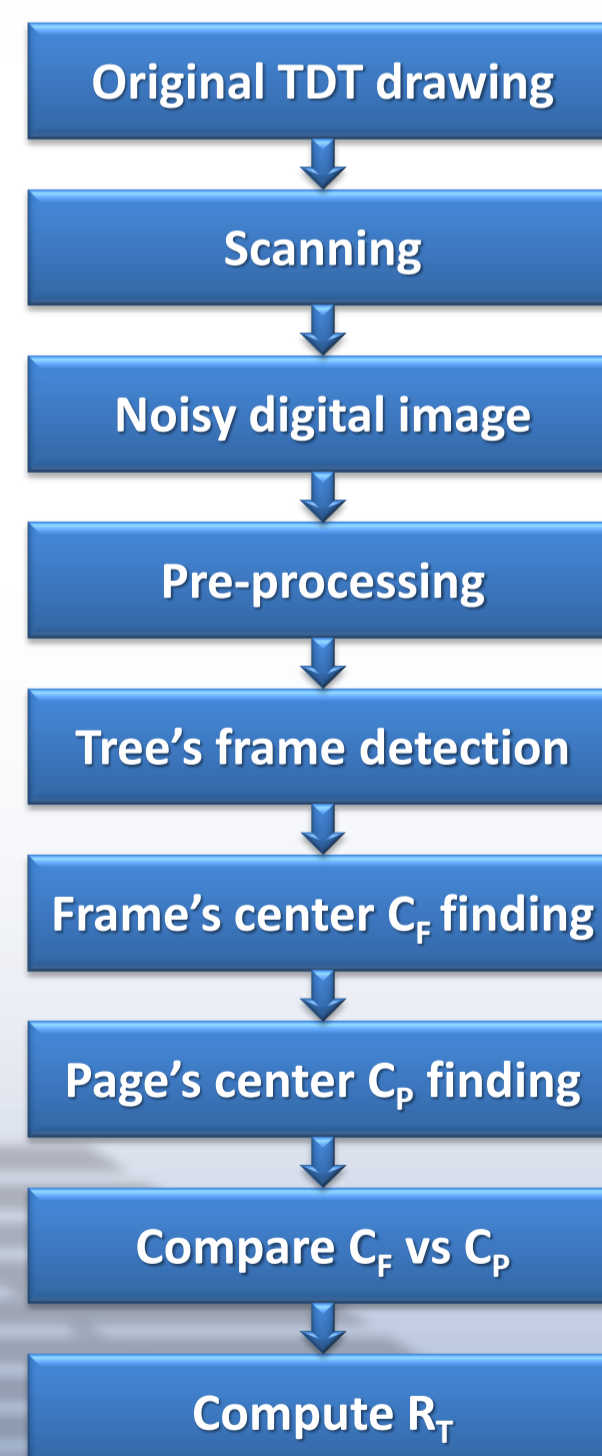
The software proved reliable for detecting the position of the tree on the A4 paper and to compute the total size ratio  $R_T$ . The good recognition rate for the position in the page was 91.80% and  $R_T$  evaluation was correct in 97.06% cases.

The described technique is a very useful tool for psychologists when they have to investigate large number of TDT drawings during short time. Automation is also useful for avoiding errors of interpretation due to tiredness or routine.

## CHARACTERISTICS

The Structural analysis is concerned with the tree's main parts measurements as shown in Figure 1 and the computation of the next three quotients used to quantify the test's results:

- $R_{TC} = B/A$  (trunk to crown ratio = trunk's length /whole tree's length);
- $R_{LR} = D/C$  (left to right side ratio = trunk's left half-width /whole trunk's width);
- $R_T = C \times A / E \times F$  (total tree's size to page space ratio = whole length of tree\*whole width of tree / paper area).



The operational diagram

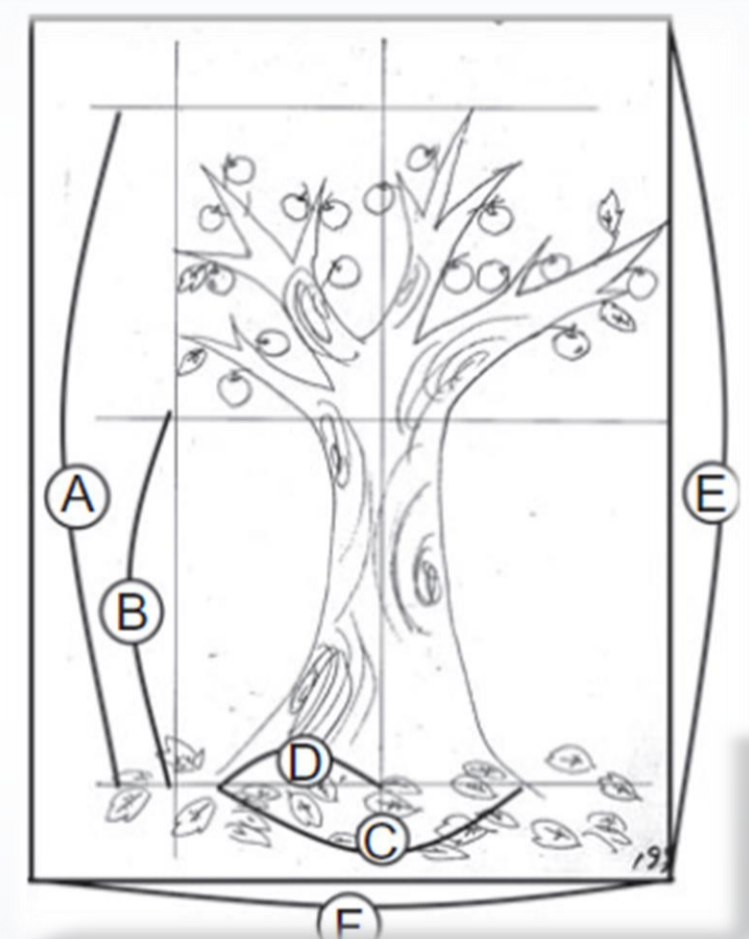


Figure 1.

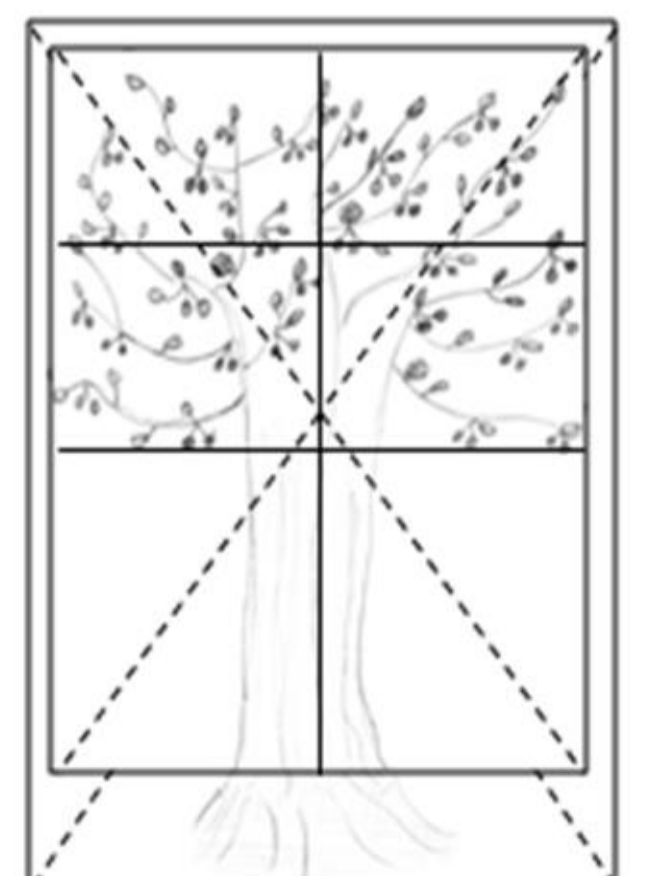


Figure 2.