

Input data:

$T = \{t_1, \dots, t_7\}$  — Set of trees.

$Y(t) = \{y_{t1}, \dots, y_{tn_t}\}$  — Set of years for which the measurements for the tree  $t$  are available,  $t \in T$

$Y = \bigcup_{t \in T} Y(t)$  — Set of all years for which the measurements are available.

$T(y) = \{t_{y1}, \dots, t_{ym_y}\}$  — Set of trees for which the measurements for the year  $y$  are available,  $y \in Y$

$$\left( T \equiv \bigcup_{y \in Y} T(y) \right)$$

Normalization procedure description:

$N$  — Number of cells for tracheid normalization.

$e^{raw}(t, y) = \{e_1^{raw}, \dots, e_\varepsilon^{raw}\}$  — Raw tracheid data where:

$$e_k^{raw} = e_k^{raw}(t, y) \in \{d_k^{raw}, c_k^{raw}\}$$

$d_k^{raw} = d_k^{raw}(t, y)$  — Diameter of the  $k^{th}$  cell in raw tracheid

$c_k^{raw} = c_k^{raw}(t, y)$  — Cell wall thickness of the  $k^{th}$  cell in raw tracheid

$$k = \overline{1, \varepsilon}, t \in T, y \in Y(t)$$

Intermediate sequence:

$$e^* = \{\underbrace{e_1^{raw}, \dots, e_1^{raw}}_N, \underbrace{e_2^{raw}, \dots, e_2^{raw}}_N, \dots, \underbrace{e_\varepsilon^{raw}, \dots, e_\varepsilon^{raw}}_N\}$$

$e = \{e_1, \dots, e_N\}$  — Normilized to  $N$  cells tracheid data, where:

$$e_i = \frac{1}{\varepsilon} \sum_{j=\varepsilon \cdot (i-1)+1}^{\varepsilon \cdot i} e_j^*, i = \overline{1, N}$$

Using this procedure, we obtain:

$d = \{d_1, \dots, d_N\}$  — Normilized to  $N$  cells data about tracheid cell diameters

$c = \{c_1, \dots, c_N\}$  — Normilized to  $N$  cells data about tracheid cell wall thicknesses

Normalized tracheid description:

$R(t, y) = d \cup c = \{d_1, \dots, d_N, c_1, \dots, c_N\}$  — Tracheid normalized to  $N$  cells. Where:

$d_i = d_i(t, y)$  — Diameter of the  $i^{th}$  cell in normalized tracheid

$c_i = c_i(t, y)$  — Cell wall thickness of the  $i^{th}$  cell in normalized tracheid

$$i = \overline{1, N}, t \in T, y \in Y(t)$$

Description of methods for forming objects for clustering:

Method A:

$$R^A(y) = \frac{1}{|T(y)|} \sum_{t \in T(y)} R(t, y), y \in Y$$

$$R_{mean}^A = \frac{1}{\sum_{t \in T} |Y(t)|} \sum_{t \in T} \sum_{y \in Y(t)} R(t, y)$$

$$O_A(y) = \frac{R^A(y)}{R_{mean}^A}, y \in Y$$

$O_A(y)$  — object for the year  $y$  obtained

Method B:

$$R^B(t) = \frac{1}{|Y(t)|} \sum_{y \in Y(t)} R(t, y), t \in T$$

$$o_B(t, y) = \frac{R(t, y)}{R^B(t)}, t \in T, y \in Y(t)$$

$$O_B(y) = \frac{1}{|T(y)|} \sum_{t \in T(y)} o_B(t, y), y \in Y$$