

traceability chain morphological subdomains

Raw buildings
Google Open Buildings
(L0)

Buildings
IDEAMAPS urban extent
(L1)

(b) building
(t) tessellation
(bl) blocks

Perform geo-elements
buildings, tessellations & blocks
(L2)

Metrics at geo-elements
buildings, tessellations & blocks
(24 metrics) (L3)

(a) autocorrelation, (b) correlation analysis, (c) logistic robust regression analysis, (d) multicollinearity, (e) ML-supervised: Random Forest, Gradient Boosting, Decision Tree.

Metrics importance analysis
for slums areas
(L4)

sd centroid corners b (1) - med
orientation b (2) - sd
alignment between b 's (3) - med
alignment between b and t (4) - med
number of t neighbours (5) - med
orientation t (6) - sd
number of bl neighbours (7) - med

Define metrics for subdomain
irregularity
(L5)

Aggregate metrics **statistics** to
the grid level (100*100 m)
(L6)

Unsupervised clustering
(k-means)
optimal # clusters
(L7)

Subdomain of deprivation
irregularity
at the city-level
(product)

Define metrics for subdomain
small & dense structures
(L5)

Aggregate metrics **statistics** to
the grid level (100*100 m)
(L6)

Unsupervised clustering
(k-means)
optimal # clusters
(L7)

Subdomain of deprivation
small & dense structures
at the city-level
(product)

sum & med
med (1) area b
med (2) elongation b
med (3) distance to neighbour b
med (4) weighted interbuilding distance
med (5) b adjacency
med (6) area t
med (7) equivalent rectangular index t
med (8) area ratio t
med (9) number of t neighbours
med (10) weighted area of t neighbours
med (11) number of bl neighbours