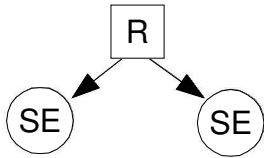


DETECTION OF SEMANTIC ENTITIES USING DESCRIPTION GRAPHS

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A **Description Graph (DG)** assigns Semantic Entities (SEs) and Relations (Rs) to its vertices to describe higher-level SEs.



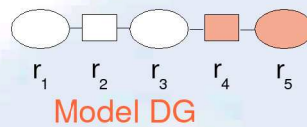
Example: SE = "Football goal"



Multimedia content presents several **instances** of SEs. Their semantic similarity to a **model** can be estimated by the measure of a **confidence** value $C(SE)$. The proposed expression combines model relevances (r_i) with instance confidences (c_i). Vertices are labeled as **necessary** (white) or **optional** (coloured). Only those optional vertices improving $C(SE)$ are considered.



expert or learning



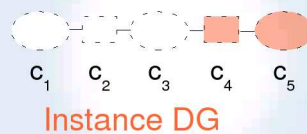
Necessary vertices Optional vertices

$$C(SE) = \frac{\sum_{i=1}^N r_i c_i + \sum_{i=N+1}^{N+O} r_i c_i}{\sum_{i=1}^N r_i + \sum_{i=N+1}^{N+O} r_i}$$



Multimedia content

analysis

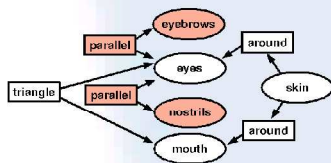


The **flexibility** of the approach allows multiple applications. DGs have been tested in the discrimination of candidates to SEs as different as frontal faces and archipelago of islands.

Frontal faces

Model: Based on research results.

Analysis: External algorithm providing a confidence value for every SE and R.



cand. 1
C=0.99



cand. 2
C=0.85



cand. 1
C=0.95



cand. 2
C=0.88



cand. 1
C=0.95

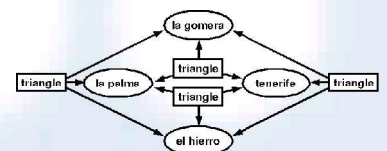


cand. 2
C=0.86

Archipelagos

Model: Based on a non distorted image.

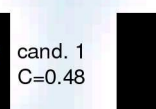
Analysis: MPEG-7 Contour Shape Descriptors (SEs) and triangle similarity.



cand. 1
C=0.88



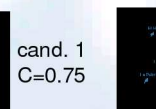
cand. 2
C=0.76



cand. 1
C=0.48



cand. 2
C=0.47



cand. 1
C=0.75



cand. 2
C=0.74