



SketchOscent: towards a knowledge-based model and interactive visualization of the odour space

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SketchOscent : Towards a knowledge-based model and interactive visualization of the odour space

The representation of an odour space is a challenging issue for scientists and professionals working in odour-related activities. Such an odour representation has to tackle the issues of a large amount of odors, dealing with subjectivity and uncertainty, a meaningful categorization for a knowledge map, and a readable and interactive visualization. Many representations of the odorant space have been proposed like : Field of odors[1], ScenTree [2], SensoryMap [3], Flavor network[4]. These initiatives turn the odorant space into easy-to-digest representations but the odour set is often restricted, and does not reflect the overlapping of categories. Thus, the related visualizations, face with difficulties to represent such odour relationships.

This work based on knowledge graphs from semantic web aims to propose a readable, interactive and publicly available representation of the aroma space, relying on a large set of odors and on overlapping categories, dedicated to olfactory and sensory practices.

<https://oniris-polytech.univ-nantes.io/sketchoscent>

Data sources

- The Good Scents Company Information System
- Flavornet

Modelling and conceptualization

- Links extracted from data sources
- Expert knowledge about odour from scientists
- Interviews and questionnaires to refine categories

Semantic web and data mining technologies

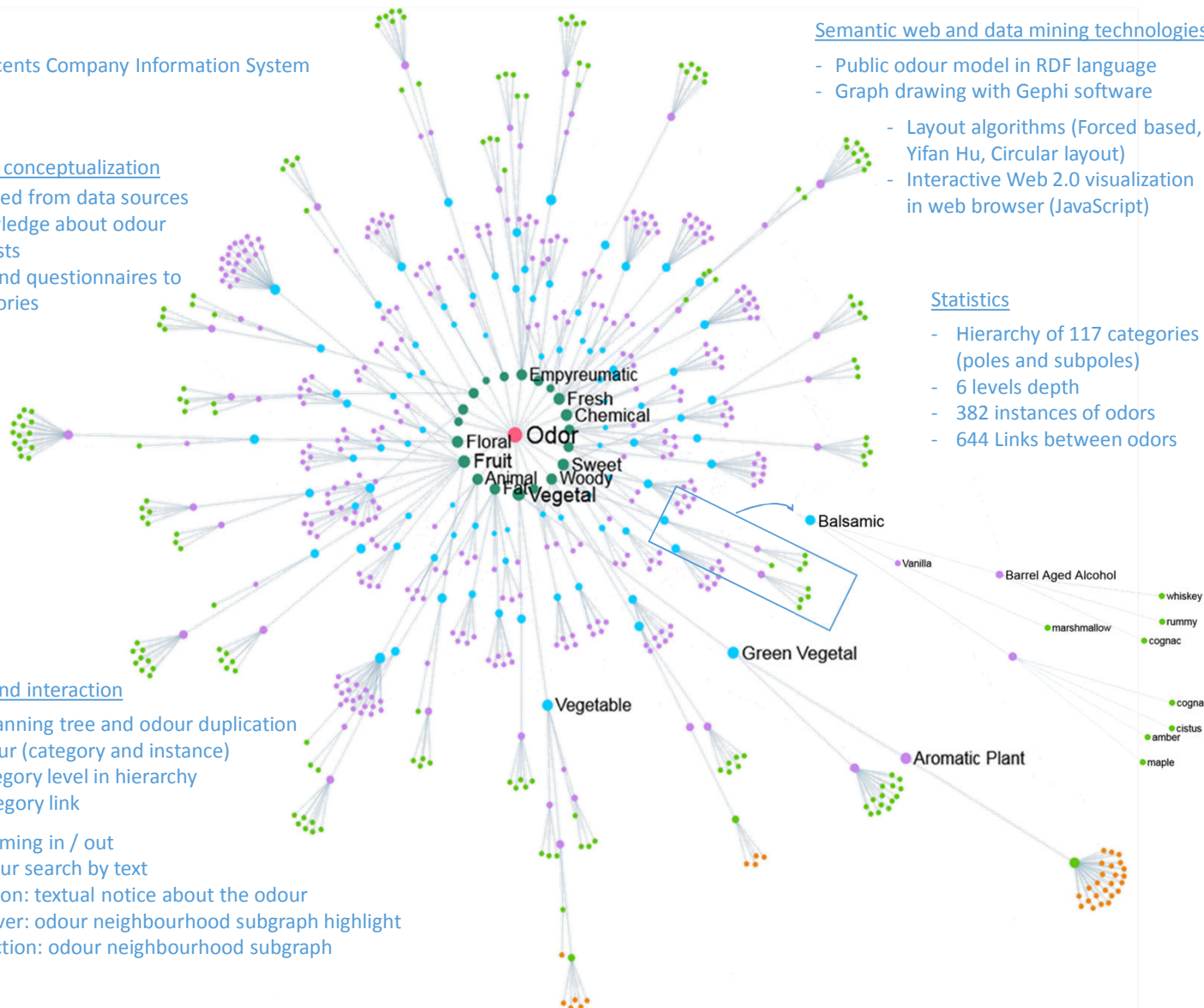
- Public odour model in RDF language
- Graph drawing with Gephi software
- Layout algorithms (Forced based, Yifan Hu, Circular layout)
- Interactive Web 2.0 visualization in web browser (JavaScript)

Visualization and interaction

- Minimal spanning tree and odour duplication
- Vertex: odour (category and instance)
- Colour: category level in hierarchy
- Arc: subcategory link
- Scaling: zooming in / out
- Search: odour search by text
- Vertex click on: textual notice about the odour
- Vertex fly over: odour neighbourhood subgraph highlight
- Vertex selection: odour neighbourhood subgraph

Statistics

- Hierarchy of 117 categories (poles and subpoles)
- 6 levels depth
- 382 instances of odors
- 644 Links between odors



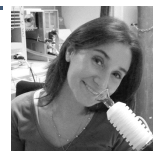
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References

- [1] J.-N. Jaubert, C. Tapiero, J.-C. Dore(1995). The Field of Odors: Toward a Universal Language for Odor Relationships. Perfumer & Flavorist, 20, 1-16.
- [2] ScenTree. <https://www.scentree.co/>.
- [3] K. McLean (2014). <https://sensorymaps.com/portfolio/comparative-smell-vocabularies/>.
- [4] Y. Y. Ahn, S. E. Ahnert, J. P. Bagrow, A. L. Barabási, (2011). Flavor network and the principles of food pairing. Scientific reports, 1, 196.



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