

Tiled top-down pyramids and segmentation of large histological images

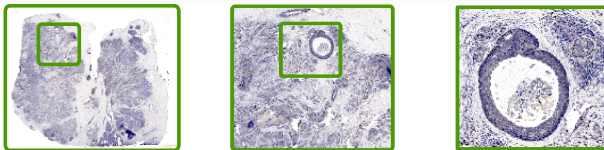
Romain Goffe¹ Luc Brun¹ Guillaume Damiand²

¹GREYC, ENSICAEN, CNRS, UMR6072, 6 Boulevard du Maréchal Juin, F-14050, Caen, France

²LIRIS, Université Lyon, CNRS, UMR5205, Université Lyon 1, F-69622, Villeurbanne, France

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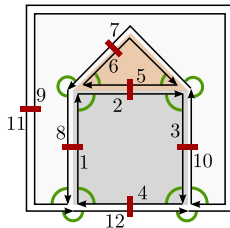
Representation of histological images



Key features

- **topology** : adjacency and imbrication relationships
- **geometry** : regions' borders
- **hierarchy** : multi-resolution images

Topological maps



Required extension to topological map model

- to represent **large** partitions
- to represent **multi-resolution** images

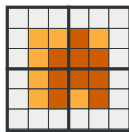
Tiled top-down pyramids

1st objective

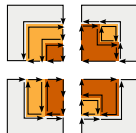
Overcome memory challenges that come with large images

Tiled maps

- one tile = one topological map
- swap/load operations
- global operators



Tiled image



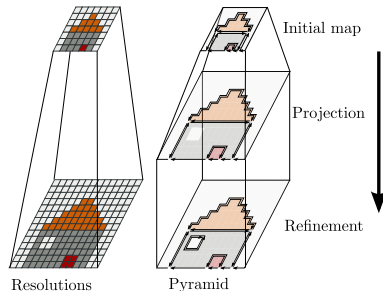
Topological tiles

2nd objective

A hierarchical extension of tiled maps

Top-down pyramids

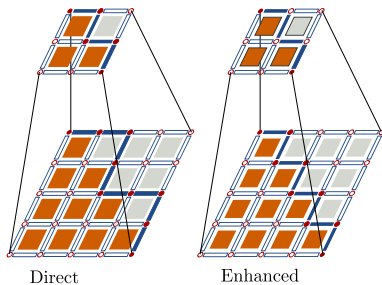
- one level = one tiled map
- up/down relationships
- preserve structures



Construction of a tiled top-down pyramid

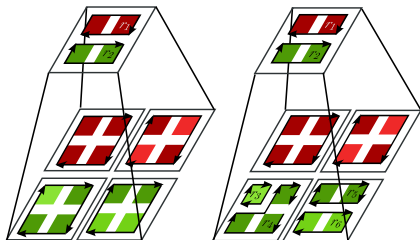
Projection of regions' borders

- preserve topology (isomorphism)
- refine geometry



Refinement of regions

- focus of attention
- causality



Top-down framework for histological images segmentation

- segmentation based on k -means algorithms
- focus of attention on regions of interest

