Implementation of range trees with fractional cascading for CGAL

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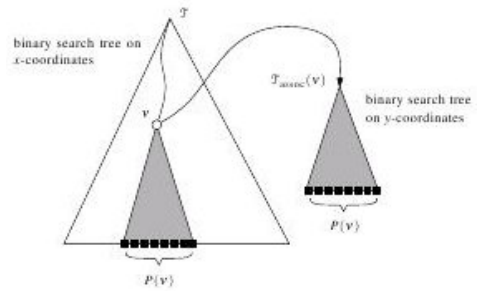
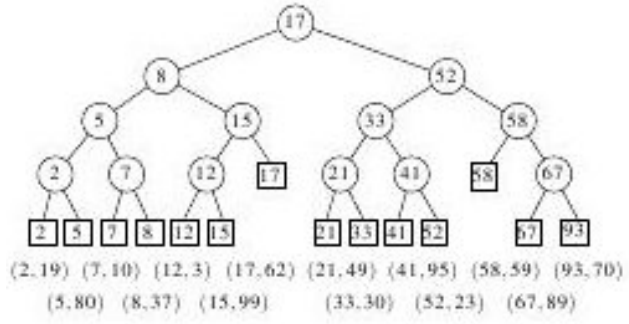
Range Trees in CGAL

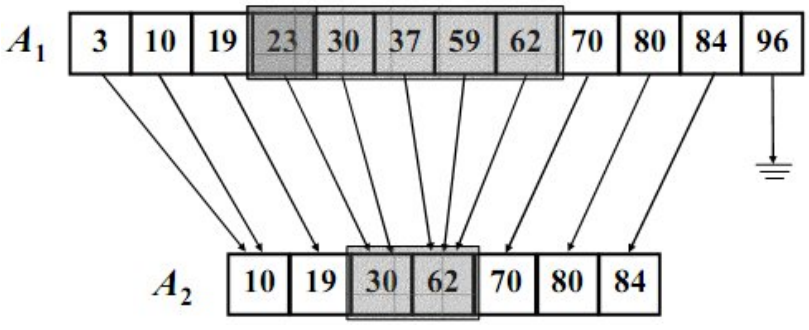


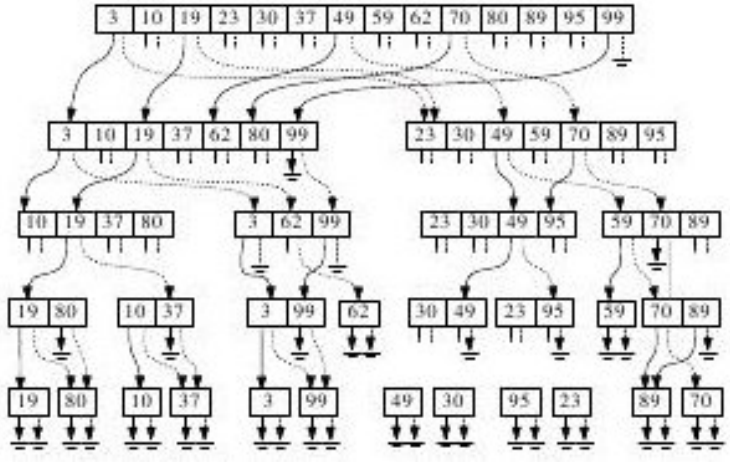
- lack of recursive construction of d-dimensional range tree [up to 4d]
- outdated implementation (memory hungry, virtual functions . . .)
- no fractional cascading

Range Trees with fractional cascading [4]

construction	$O(n \log^{d-1} n)$
space	$O(n \log^{d-1} n)$
time	$O(\log^{d} n + k)$
time	$O(\log^{d-1} n + k)$
optimal	$O(\log^{c} n + k)$ [2, 1]







about implementation . . .

C + +

Generic Programming templates

STL data structures (vectors)
algorithms (sorting, binary search)

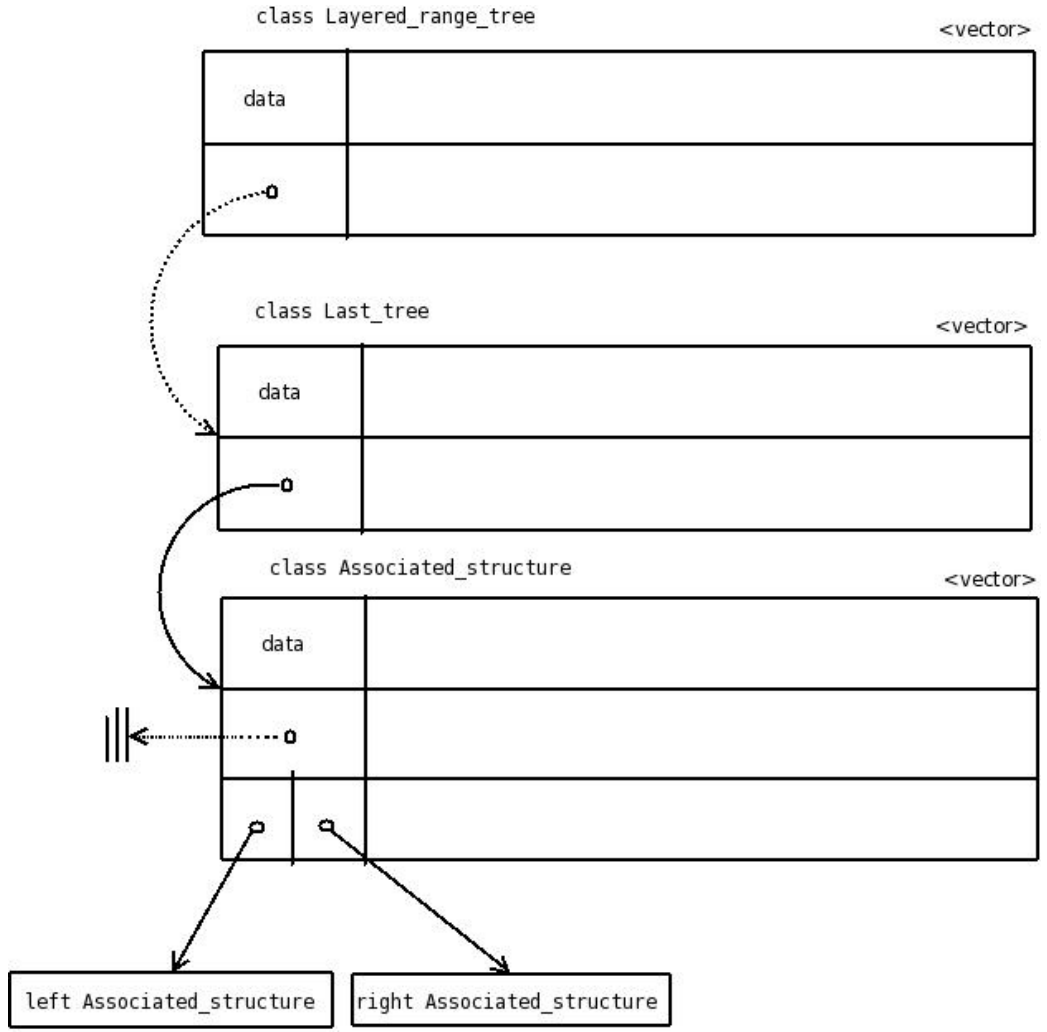
about design . . .

Tree representation:
- STL vectors

Tree traversal:
- index arithmetic

Classes:
- Layered_range_tree
- Last_tree
- Associated_structure

Tree construction:
- “double recursion”



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Ευχαριστώ!