

Programming #4 (4190.410)

Due: November 14, 2012

Implement the following algorithms:

1. A recursive bottom-up algorithm for constructing an AABB tree for an open polygonal chain \mathcal{C} (in the plane) that connects a sequence of points $p_i = (x_i, y_i)$, for $i = 0, \dots, n$, for some $n > 0$.
2. A recursive algorithm for testing the self-intersection of the polygonal chain \mathcal{C} using the AABB tree constructed for \mathcal{C} .
3. A recursive algorithm for testing the intersection between two polygonal chains \mathcal{C} and \mathcal{D} using their respective AABB trees.

We may generate a polygonal chain by sampling a cubic Bézier curve $C(t)$ at uniform parameters $t_i = i/n$, for $i = 0, \dots, n$.