

## Programming #3: Part II (4190.410)

Due: October 28, 2015

Design an interactive system that can control the shape of a bicubic Bézier surface:

$$S(u, v) = \sum_{i=0}^3 \sum_{j=0}^3 \mathbf{p}_{ij} B_i^3(u) B_j^3(v), \quad 0 \leq u, v \leq 1,$$

and a line segment  $L(t) = (1 - t)\mathbf{q}_0 + t\mathbf{q}_1$ ,  $0 \leq t \leq 1$ , by dragging their control points.

**Part I:** Implement an algorithm for approximating the surface using quadrangles within a given error bound.

**Part II:** Implement an algorithm for intersecting the surface  $S(u, v)$  and the line segment  $L(t)$  using the AABB tree of the surface.