

## Computational Geometry

## Exercise Set 3

## HS09

URL: <http://www.ti.inf.ethz.ch/ew/courses/CG09/>

### Exercise 1

Let  $P$  be a convex  $n$ -gon and  $\mu$  be a measure on all the  $\binom{n}{3}$  possible triangles formed by its vertices. Give an algorithm which finds a triangulation  $T$  minimizing

$$\max\{\mu(\Delta) \mid \Delta \text{ is a triangle of } T\}$$

the weight of the “heaviest” triangle of  $T$  in time  $O(n^3)$ .

### Exercise 2

- (a) Using the Euler formula derive that every planar graph on  $n$  vertices has at most  $3n - 6$  edges.
- (b) Prove that every planar graph has a vertex of degree at most 5.
- (c) Formulate and prove a variant of the Euler Formula for disconnected graphs.