

Online Motion Planning, SS 17
Exercise sheet 11
University of Bonn, Inst. for Computer Science, Dpt. I

- *You can hand in your written solutions until Tuesday, 18.07., 14:15, postbox in front of room E.01 LBH.*

Exercise 31: **Simple escape path** **(4 points)**

1. Is the shortest escape path always unique? Answer the question for convex or non-convex regions R .
2. Show that for non-convex regions the diameter need not be an escape path. Define a path for any simple polygon, that is always an escape path.

Exercise 32: **Escape path calculations** **(4 points)**

1. Show that the median of a triangle is always shorter than the average of the adjacent sites.
2. Show that for $\alpha = 60^\circ$ and Besicovitsch zig-zag path, b_α equals $\sqrt{\frac{28}{27}}$.

Exercise 33: **Escape path proof arguments** **(4 points)**

1. Show that Theorems 69 and 70 also hold for closed escape paths.
2. Give a formal argument that for $\alpha = 60^\circ$ all Zig-Zag path constructions of Figure 6.5 i) are indeed escape paths.