

# On Perimeter and Volume Estimation of a Set With Smooth Boundary

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We consider the estimation of the perimeter and volume of a domain in the plane with smooth boundary. ‘Smooth here is understood as having bounded curvature pointwise. We approach the problem from a purely geometric perspective and suggest the use of the alpha-shape proposed by H. Edelsbrunner in the context of computer graphics this is in contrast with the work of Korostelev & Tsybakov where a boundary fragment approach is taken. We derive minimax rates and establish the performance of our estimators. For the problem of volume estimation, we are not able to close the gap.

Joint work with Beatriz Pateiro-López and Alberto Rodríguez-Casal. The preprints are available online:

<https://arxiv.org/abs/1507.00065>

<https://arxiv.org/abs/1605.01333>