A novel $W^{1,\infty}$ approach to shape optimisation with Lipschitz domains

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In this talk, we discuss a novel method for shape optimisation. We propose to use the shape derivative to determine deformation fields which represent directions of steepest descent in the topology of $W^{1,\infty}$. We demonstrate our approach by restricting to star-shaped domains which we represent as functions definted on the unit $(n-1)$-sphere. In this setting we provide the specific form of the shape derivative and show that directions of steepest descent exist. We present several numerical experiments in two dimensions which illustrate our approach. This is based on joint work with Klaus Deckelnick and Michael Hinze.