

A domain-morphing approach to smoothing over complex regions

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Smoothing over complex 2-D regions is difficult. Several approaches have been proposed in past years including finite element analysis (Ramsay, 2002), within-area distance (Wang & Ranalli, 2007) and recently soap film smoothing (Wood, Bravington & Hedley, 2008.) Here I investigate an alternative method based on the Schwarz-Christoffel transform from complex analysis. This takes the region and “morphs” it to a rectangle or disk in a prescribed way. We may then smooth over the transformed area using penalized regression splines and transform this smooth back to the original domain in order to perform analysis. I explore the utility of this transform on both real and simulated data.

References

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