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## Toward a paver replacement

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### Abstract

In recent years, cross field guided quad meshing algorithms have found success in computer graphics applications. These methods have the capability of producing high quality block structured surface meshes. As most of these algorithms have not been designed for meshing on CAD surfaces for solid mechanics and other finite element applications, little attention has been paid to common requirements in these applications such as strict boundary alignment on all geometric curves and conformation to prescribed boundary node placement. We seek to design an algorithm capable of producing high quality block structured meshes on arbitrary surfaces such that the mesh conforms to a predetermined boundary interval assignment and follows a sizing function on the interior of the domain. Such an algorithm would be an ideal replacement for unstructured methods commonly used for finite element meshing such as the paving algorithm and its variants. In this note we outline a strategy that we expect will be able to meet these requirements. For each step in the pipeline, we discuss solutions which are currently available as well as open problems that will need to be resolved.

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