Unstructured C^1 multi-patches of tensor product B-Splines

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Isogeometric Analysis has the ambition of using a unique definition for CAD and PDEs Analysis . But most of the corresponding constructions are based on a single path or on esoteric spline families such as T-Splines. Complex real life constructions necessitates multi-patch surfaces or volumes. Hence the interest in the study of unstructured multi-patch C^1 isogeometric spaces. This question is completely solved solved in our book for 2-D meshes with any valence on Bezier patches. This has generated results for C^1 and C^2 unstructured spline patches giving a family of higher order approximation for second to sixth order PDEs. We will also review the question of extension to 3D (volume) splines.

References:
[1] M. Bercovier and T Matskewich. Smooth Bézier surfaces over arbitrary quadrilateral meshes, Smooth Bézier Surfaces over Unstructured Quadrilateral Meshes -Springer- 2017