Multi-nets.
Discrete and smooth surfaces with characteristic subnet properties

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We derive a common framework that allows us to characterize surface patches by a purely discrete approach. Our guiding idea is:

Characterize the smooth surface patches by the structure of the underlying discrete net.

The idea of the characterizations is to study smooth and discrete nets that satisfy a characteristic property not only for elementary quadrilaterals, but for arbitrary parameter rectangles. For discrete planar quadrilateral nets, circular nets, Q^*-nets and conical nets we obtain a characterization of the corresponding discrete *multi*-nets. In the limit these discrete nets lead to some classical classes of smooth surfaces. Furthermore, we propose to use the characterized discrete nets as discrete extensions for the nets to obtain structure preserving subdivision schemes.

Joint work with: Helmut Pottmann, Thilo Rörig.