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Basic sets in the digital plane

Abstract: A set K in the plane $\mathbb{R}^2$ is said to be *basic* if each continuous function $f\colon K \to \mathbb{R}$ can be expressed as a sum $f(x,y) = g(x)+h(y)$ with $g, h\colon \mathbb{R} \to \mathbb{R}$ continuous functions. Analogously we define a digital set K_k in the digital plane to be basic if for each digital function $f : K_k \to \mathbb{R}$ there exist digital functions $g, h : \mathbb{I}_k \to \mathbb{R}$ on the digital unit interval $\mathbb{I}_k$ such that $f(x,y) = g(x) + h(y)$ for each pixel $(x,y) \in K_k$. Basic subsets of the plane were characterized by Sternfeld and Skopenkov.

In our talk we shall prove a digital analogy of their result. Moreover we shall explore the properties of digital basic sets, and their possible use in image analysis.