Subpixel-based image scaling can improve the apparent resolution of displayed images by controlling individual subpixels rather than whole pixels. However, improved luminance resolution brings chrominance distortion, making it crucial to suppress color error while maintaining sharpness. Moreover, it is challenging to develop a scheme that is applicable for various subpixel arrangements and for arbitrary scaling factors. In this paper, we address the aforementioned issues by proposing a generalized continuous-domain analysis model, which considers the low-pass nature of the human visual system (HVS). Specifically, given a discrete image and a grid-like subpixel arrangement, the signal perceived by the HVS is modeled as a 2D continuous image. Minimizing the difference between the perceived image and the continuous target image leads to the proposed scheme, which we call continuous-domain analysis for subpixel-based scaling (CASS). To eliminate the ringing artifacts caused by the ideal low-pass filtering in CASS, we propose an improved scheme, which we call CASS with Laplacian-of-Gaussian filtering. Experiments show that the proposed methods provide sharp images with negligible color fringing artifacts. Our methods are comparable with the state-of-the-art methods when applied on the RGB stripe arrangement, and outperform existing methods when applied on other subpixel arrangements.