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# Size-Density Spectra and their Application to Image Classification

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## **Abstract**

In this paper we develop a density opening operator that is shown to satisfy the properties of an algebraic opening. This density opening enables the development of a number of variants of pattern spectra, which quantify the size or density information of a blob arrangement within the image. In contrast to regular morphological pattern-size spectra, the proposed pattern spectra are spatially sensitive and robust to noise distortions. A size-density signature was introduced and used for solving image classification tasks. Application of the pattern size density spectrum to the classification of real world medical images is illustrated.