Resolution Restoration/Upscaling of images via extrapolation with excursion metrics

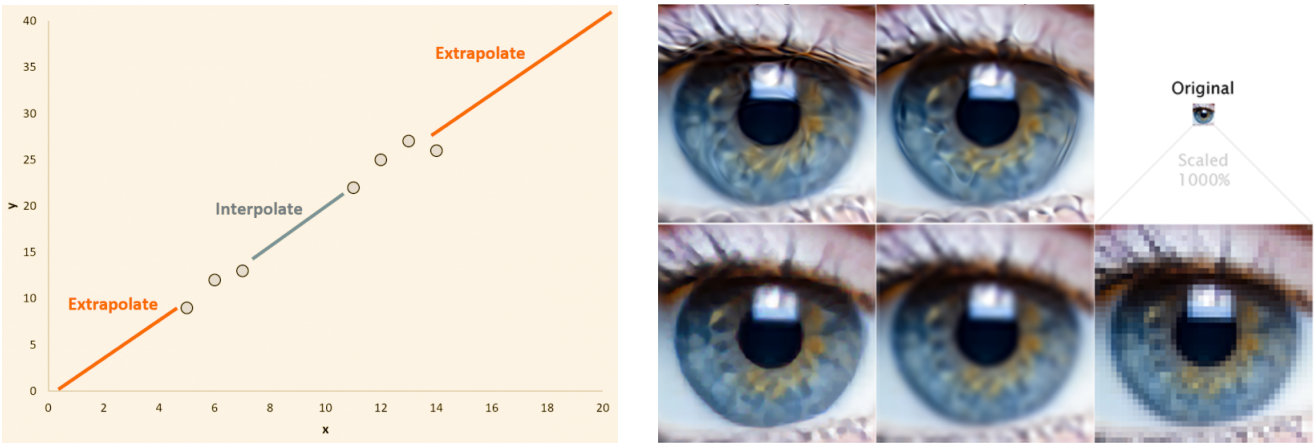

Figure 1: Illustration of the approach and its simple example.

In our study, we treat image data as a realization of a real/vector-valued random field within a finite region, typically in 2 or 3 dimensions. Image compression, commonly employed for various purposes, results in a reduction of resolution and the consequential loss of information.

Our objective is to develop a method for the restoration of the original image. From a statistical perspective, it is an interpolation problem. Specifically, we aim to predict or interpolate the original realization of the random field (essentially unobservable data) based on the available data derived from the compressed image.