Figure 1: A diagram of the region $D(\mathbf{s})$ in the image domain Ω. One can think of the individual gradients $\nabla I_i(\mathbf{s})$ as observations of the underlying gradient of the image surface $\nabla I(\mathbf{s})$. For the local linearisation to be valid between I_0 and I_2, the gradient must be constant along the dotted line. To assess the validity of the linearisation, we can look at the gradients $\nabla I_0(\mathbf{s})$, $\nabla I_1(\mathbf{s})$ and $\nabla I_2(\mathbf{s})$; if any of these gradients are different, then the linearisation is invalid.