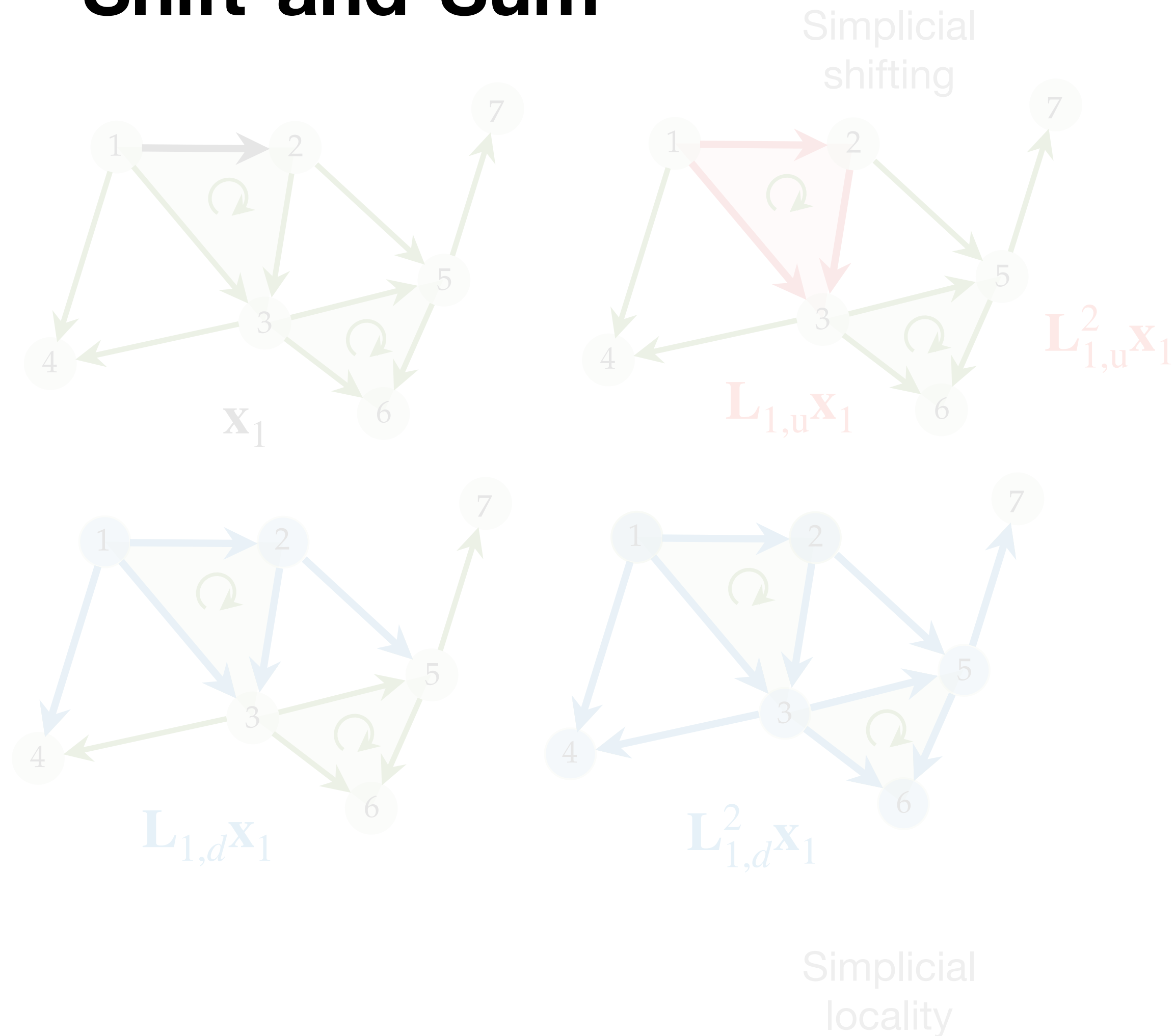


1. Simplicial Convolutions and Filters

Edge Convolution

Shift-and-Sum



Simplicial Convolutional Filter

$$\mathbf{H} := \mathbf{H}(\mathbf{L}_d, \mathbf{L}_u; \alpha, \beta) = \sum_{k=0}^{K_d} \alpha_k \mathbf{L}_d^k + \sum_{k=0}^{K_u} \beta_k \mathbf{L}_u^k$$