



Figure 9.14: Comparison of local connections, convolution, and full connections.

(*Top*) A locally connected layer with a patch size of two pixels. Each edge is labeled with a unique letter to show that each edge is associated with its own weight parameter.

(*Center*) A convolutional layer with a kernel width of two pixels. This model has exactly the same connectivity as the locally connected layer. The difference lies not in which units interact with each other, but in how the parameters are shared. The locally connected layer has no parameter sharing. The convolutional layer uses the same two weights repeatedly across the entire input, as indicated by the repetition of the letters labeling each edge.

(*Bottom*) A fully connected layer resembles a locally connected layer in the sense that each edge has its own parameter (there are too many to label explicitly with letters in this diagram). However, it does not have the restricted connectivity of the locally connected layer.