# Chapter 6

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Link to chapter

## 1 Convolutional Neural Networks

- Convolutional Neural Networks
- Translation invariance in images implies that all patches of an image will be treated in the same manner.
- Locality means that only a small neighborhood of pixels will be used to compute the corresponding hidden representations.
- In image processing, convolutional layers typically require many fewer parameters than fully-connected layers.
- The core computation of a two-dimensional convolutional layer is a two-dimensional cross-correlation operation. In its simplest form, this performs a cross-correlation operation on the two-dimensional input data and the kernel, and then adds a bias.

## 2 Padding and Stride

- Padding can increase the height and width of the output. This is often used to give the output the same height and width as the input.
- The stride can reduce the resolution of the output, for example reducing the height and width of the output to only 1/n of the height and width of the input ( n is an integer greater than 1 ).

## References

Zhang, A., Lipton, Z. C., Li, M., & Smola, A. J. (2020). *Dive into deep learning.* (`https://d2l.ai`)