

Glossary: Advanced CNNs in Keras

Welcome! This alphabetized glossary contains many of the terms you'll find within this course. This comprehensive glossary also includes additional industry-recognized terms not used in course videos. These terms are important for you to recognize when working in the industry, participating in user groups, and participating in other certificate programs.

| Term | Definition |
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| Activation function | A mathematical function used in neural networks to determine the output of a neuron. |
| Adam optimizer | An optimization algorithm that can be used instead of the classical stochastic gradient descent procedure to update network weights iteratively based on training data. |
| Augmentation | A process of increasing the diversity of training data by applying various transformations like rotation, scaling, and so on. |
| Binary cross-entropy | A loss function used for binary classification tasks, measuring the performance of a classification model whose output is a probability value between 0 and 1. |
| Convolution | A mathematical operation used in deep learning, especially in convolutional neural networks (CNNs), for filtering data. |
| Custom augmentation function | A user-defined function that applies specific transformations to images during data augmentation, providing full control over the augmentation process. |
| Data augmentation | Techniques used to increase the diversity of training data by applying random transformations such as rotation, translation, flipping, scaling, and adding noise. |
| Deconvolution | Also known as transpose convolution, this is a technique used to up-sample an image, often used in generative models. |
| Dense layer | A fully connected neural network layer, where each input node is connected to each output node, commonly used in the final stages of a network. |
| Feature map | A set of features generated by applying a convolution operation to an image or data input. |
| Feature-wise normalization | A technique to set the mean of the data set to 0 and normalize it to have a standard deviation of 1. |
| Fine-tuning | The process of unfreezing some of the top layers of a pre-trained model base and jointly training both the newly added layers and the base layers for a specific task. |
| Flatten layer | A layer that converts the output of a convolutional layer to a 1D array, allowing it to be passed to a fully connected layer. |
| Generative adversarial networks (GANs) | A class of machine learning frameworks where two neural networks compete with each other to create realistic data samples. |
| Height shift range | A data augmentation parameter that randomly shifts an image vertically, altering its position to improve model robustness to vertical translations. |
| TensorFlow Hub | A repository of reusable machine learning modules, which can be easily integrated into TensorFlow applications to accelerate development. |
| TensorFlow.js | A library for training and deploying machine learning models in JavaScript environments, such as web browsers and Node.js. |
| Horizontal flip | A data augmentation technique where the image is flipped horizontally, creating a mirror image to increase data diversity. |
| ImageDataGenerator | A Keras class used for generating batches of tensor image data with real-time data augmentation. |
| ImageNet | A large visual database designed for use in visual object recognition software research, often used as a data set for pre-training convolutional neural networks. |
| Image processing | The manipulation of an image to improve its quality or extract information from it. |
| Kernel | A small matrix used in convolution operations to detect features such as edges in images. |
| Latent vector | A vector representing compressed data in a lower-dimensional space, often used in generative models. |
| Pre-trained model | A model previously trained on a large data set, which can be used as a starting point for training on a new, related task. |
| Random noise | A type of custom augmentation that adds random noise to images, simulating different lighting conditions and sensor noise to make models more robust. |
| Rotation range | A data augmentation parameter that randomly rotates an image within a specified range of degrees, enhancing model robustness to rotations. |
| Sample-wise normalization | A technique to set the mean of each sample to 0 and normalize each sample to have a standard deviation of 1. |
| Semantic segmentation | A deep learning task that involves classifying each pixel in an image into a predefined class. |
| Shear range | A data augmentation parameter that applies a shear transformation to an image, slanting it along one axis to simulate different perspectives. |
| Stride | A parameter in convolution that determines the step size of the kernel when moving across the input data. |
| TensorFlow | An open-source machine learning library used for various tasks, including deep learning and image processing. |

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| Transfer learning | A method where a pre-trained model is adapted to a new, related task by adjusting its weights, allowing it to perform well even with limited data for the new task. |
| Transpose convolution | An operation that reverses the effects of convolution, often used for up-sampling in image processing. |
| VGG16 | A convolutional neural network model pre-trained on the ImageNet data set, commonly used in transfer learning for tasks involving image classification. |
| Width shift range | A data augmentation parameter that randomly shifts an image horizontally, altering its position to improve model robustness to horizontal translations. |
| Zoom range | A data augmentation parameter that randomly zooms in or out on an image, altering its scale during training. |



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