**Sports Image Classification Project**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Model** | **Augmentation** | **Accuracy** | **epoch** | **LR** | **scores** |
| **VGG 16** | **Yes** | **Train 100%**  **Validation 99.59%** | **8** | **0.0001** | **Private:92.75%**  **Public:90.77** |
| **AlexNet** | **Yes** | **Train 88.27%**  **Validation 77%** | **13** | **0.0001** | **Private:63.4%**  **Public:64.56%** |

**Dataset:**

We use labeled dataset and it’s about sports (Basketball, Football, Rowing, Swimming, Tennis and Yoga)

To create a model that recognize sport between them.

The dataset contains about 1681 img for training and 688 img for testing.

The data for each sport:

Basketball:196

Football:400

Rowing:202

Swimming:240

Tennis:185

Yoga:458

**Preprocessing Step:**

first: we use one hot encoding for label (0, 1, 2, 3, 4, and 5).

Img size:224\*224

Note: the dataset contains before augmentation1681 images, we take 1345 images for training and 337 images for test.

**Augmentation:**

We use zoom, rotation, and flipping.

Note: the dataset contains 18,491 images after augmentation, we take 14792 images for training and 3699 images for validation.

**Architectures:**

VGG16

Graphical user interface, text

Description automatically generated

Architecture:

- Convolution layer with 64 filters each of them [3X3].

- Convolution layer with 64 filters each of them [3X3].

- Maximum pooling layer with pooling size [2x2].

- Convolution layer with 128 filters each of them[3X3].

- Convolution layer with 128 filters each of them[3X3].

- Maximum pooling layer with pooling size [2x2].

- Convolution layer with 256 filters each of them[3X3].

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- Maximum pooling layer with pooling size [2x2].

- Note: we use relu activation function in all convolution layers

- Flatten layer.

- Dense layer with 3072 neurons.

- Output layer with 6 neurons.

AlexNet

Table

Description automatically generated

-Convolution layer with 96 filters each of them [11x 11].

-Maximum pooling layer with pooling size [2x2].

-Convolution layer with 256 filters each of them [11x11].

-Maximum pooling layer with pooling size [6x6].

-Convolution layer with 384 filters each of them [3x3].

-Convolution layer with 384 filters each of them [3x3].

-Convolution layer with 256 filters each of them [3x3].

-Convolution layer with 128 filters each of them [2x2].

-Maximum pooling layer with pooling size [2x2].

Note: we use relu activation function in all convolution layers

-Flatten layer.

-Dense layer with 4096 neurons.

-Dropout layer(40%).

-Dense layer with 1000 neurons.

-Dropout layer(40%).

-Dense layer with 6 neurons.

-Output layer with 6 neurons.

Added more layers

Graphical user interface, text, application, email

Description automatically generated

-Convolution layer with 96 filters each of them [11x 11].

-Maximum pooling layer with pooling size [2x2].

-Convolution layer with 256 filters each of them [11x11].

-Maximum pooling layer with pooling size [2x2].

-Convolution layer with 256 filters each of them [3x3].

-Maximum pooling layer with pooling size [2x2].

-Convolution layer with 384 filters each of them [3x3].

-Convolution layer with 256 filters each of them [2x2].

-Maximum pooling layer with pooling size [2x2].

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-Dropout layer(40%).

-Dense layer with 1000 neurons.

-Dropout layer(40%).

Dense layer with 6 neurons.

-Output layer with 6 neurons.

We use another Architectures like leNet and ZFNET but we choose this two architectures (vgg16,AlexNet) according to the accuracy.