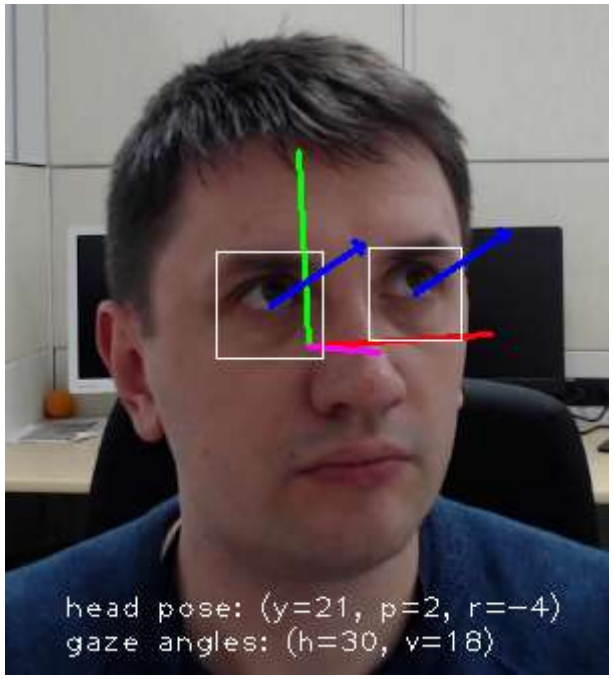
gaze-estimation-adas-0002

Use Case and High-Level Description

This is a custom VGG-like convolutional neural network for gaze direction estimation

Example and Gaze Vector Definition



IN THIS DOCUMENT

The network takes three inputs: square crop of left eye image, square crop of right eye image, and three head pose angles – (yaw, pitch, and roll) (see figure). The network outputs 3-D vector corresponding to the direction of a person's gaze in a Cartesian coordinate system in which z-axis is directed from person's eyes (mid-point between left and right eyes' centers) to the camera center, y-axis is vertical, and x-axis is orthogonal to both z,y axes so that (x,y,z) constitute a right-handed coordinate system.

Specification

METRIC	VALUE
GFlops	0.139
MParams	1.8
Source framework	Caf

Validation Dataset

Two random held out inviduals from an internal dataset containing images of 60 pec
directions.

Validation Results

The accuracy of gaze direction prediction is evaluated through the use of MAE of angle (in degrees) between the ground truth and predicted gaze direction.

DATASET	MAE, DEGREES	STANDARD DEVIATION OF AE, DEGREES
Internal dataset	6.95	3.58

Performance

Inputs

- Blob in the format [BxCxHxW] where:
  - B - batch size
  - C - number of channels
  - H - image height
  - W - image width

with the name `left_eye_image` and the shape [1x3x60x60].

- Blob in the format [BxCxHxW] where:
  - B - batch size
  - C - number of channels
  - H - image height
  - W - image width

with the name `right_eye_image` and the shape [1x3x60x60].

- Blob in the format [BxC] where:
  - B - batch size
  - C - number of channels

IN THIS DOCUMENT

with the name `head_pose_angles` and the shape [1x3].

Outputs

The net outputs a blob with the shape: [1, 3], containing Cartesian coordinates of ga
that the output vector is not normalizes and has non-unit length.

Output layer name in Inference Engine format:

`gaze_vector`

Output layer name in Caffe2 format:

`gaze_vector`

Legal Information

[*] Other names and brands may be claimed as the property of others.

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