Fundamentals of Computer Vision Project 1

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The current project is an application able to apply image augmentation to all the images from a folder, in any order or number, resulting in a new folder containing all the augmented images.

The augmentations that this application supports are the following:

* Translation – translates the picture on X and/or Y axis
* Scaling – scales the picture on X and/or Y axis
* Shearing – shear the picture on X and/or Y axis
* Rotation – rotates the image around the center point
* Flipping – flips the picture around the X and/or Y axis
* Gaussian blurring – applies the gaussian blur to the picture based on a kernel size
* Median filtering – applies the median filtering corresponding to a coeficient
* Bilateral filtering – applies the bilateral filtering using a filter diameter and the sigmaColor
* Gama adjustment – applies the gamma adjustment

The configuration file hast the name “cfg.json” and has to contain a list of augmentations lists that will be applied in their order, from the configuration folder, to all the images. The structure of the config file is the following:

{

“augmentations”: [

{ “run”: true/false,

“augs”: [

{“name”: “augmentationName”,

“args”: { List of arguments of the augmentation } }, … more augmentations]

}, …

]

}

The *augs* represent the list of augmentations to be applied in order to the same image resulting one sole image as a result. *augmentations* is the list of augmentation lists, pretty much the number of elements in this list will give us the respective amount of resulting images => Number of Imput images \* Augmentations = Number of final augmented images.

The list of parameters for each augmentation is the following:

* Translation: t1 and t2, the % of translation on X and Y
* Scaling: a1 and a2, the alpha of scaling on X and Y
* Shear: a and b, then shearing on X and Y
* Rotate: angle, the angle of rotation
* Flip: mode, representing the mode of flipping 0 on X, 1 on Y and -1 around both
* Gaussian blurring: ksize, the size of the kernel in px
* Median filtering: coef
* Bilateral filter: diameter and sigmaColor
* Gamma adjustment: gamma

An example of a configuration file:

{

    "augmentations": [{

            "run": true,

            "augs": [{

                    "name": "translation",

                    "args": {

                        "t1": 0.3,

                        "t2": 0.3

                    }

                },

                {

                    "name": "scale",

                    "args": {

                        "a1": 0.5,

                        "a2": 1.5

                    }

                }

            ]

        },

        {

            "run": true,

            "augs": [{

                    "name": "rotate",

                    "args": {

                        "angle": 90

                    }

                },

                {

                    "name": "gaussianBlur",

                    "args": {

                        "ksize": 24

                    }

                }

            ]

        },

        {

            "run": true,

            "augs": [{

                    "name": "shear",

                    "args": {

                        "a": 0.4,

                        "b": 0.5

                    }

                },

                {

                    "name": "medianFilter",

                    "args": {

                        "coef": 4

                    }

                },

                {

                    "name": "adjust\_gamma",

                    "args": {

                        "gamma": 4

                    }

                }

            ]

        }

    ]

}