IPCV – Scilab Image Processing & Computer Vision

- Analytic Geometry
  - plot3dot — 3-D Parametric plot for opoints
- Camera Handling
  - camclose — Close a camera
  - camcloseall — Close all opened cameras.
  - camlistopened — Show all opened camera.
  - camopen — Open a camera.
  - camread — Grabs and returns a frame from a camera
- Deep Learning
  - dnn_forward — Runs forward pass to compute output of layer with name layer_name
  - dnn_getparam — Get the layer's parameters
  - dnn_list — List all loaded DNN models in memory
  - dnn_readmodel — Read/Import DNN model from disk
  - dnn_showfeature — Visualize the DNN feature map
  - dnn_showparam — Visualize the DNN parameters (filter) in spatial domain
  - dnn_showparamf2d — Visualize the DNN parameters (filter) in frequency domain (2D)
  - dnn_showparamf3d — Visualize the DNN parameters (filter) in frequency domain (3D)
  - dnn_unloadallmodels — Unload all loaded DNN models from memory
  - dnn_unloadmodel — Unload DNN model from memory
- Feature Detection, Description and Matching
  - imbestmatches — Find the best matched features from 2 features objects and the matching matrix
  - imdetect_BRISK — Detect features from an image with BRISK algorithm
  - imdetect_FAST — Detect features from an image with FAST algorithm. Usually used for corner features.
  - imdetect_GFTT — Detect features from an image with GFTT algorithm
  - imdetect_MSER — Detect features from an image with MSER algorithm
  - imdetect_ORB — Detect features from an image with ORB algorithm
  - imdetect_SIFT — Detect features from an image with SIFT algorithm
  - imdetect_STAR — Detect features from an image with STAR algorithm
  - imdetect_SURF — Detect features from an image with SURF algorithm
  - imdrawmatches — Draw matching result for 2 images
  - imextract_DescriptorBRISK — Computes the descriptors for a set of keypoints detected in an image with BRISK method.
  - imextract_DescriptorORB — Computes the descriptors for a set of keypoints detected in an image with ORB method.
  - imextract_DescriptorSIFT — Computes the descriptors for a set of keypoints detected in an image with SIFT method.
  - imextract_DescriptorSURF — Computes the descriptors for a set of keypoints detected in an image with SURF method.
  - immatch_BruteForce — Brute-force matcher for features matching.
  - plotfeature — Plot the features detected by feature detectors
- Filter Design and Visualization
  - fft2pad — Pad smaller matrix with zeros to the given size before transformation.
  - immesh — Visualize 2D matrix using mesh plot, useful for frequency response visualization.
  - imsmoothsurf — Visualize 2D matrix using smooth surf plot, useful for frequency response visualization.
  - imsurf — Visualize 2D matrix using surf plot, useful for frequency response visualization.
  - mkfftfilter — Create frequency domain filter
- Image Analysis and Statistics
  - corr2 — 2D correlation coefficient

    - edge — Find edges in a single channel image.
    - imhist — get the histogram of an image
    - impixel — Return selected pixel coordinates and values
    - improfile — Return profiles for the selected 2 points
    - mean2 — Average/mean of matrix elements
    - std2 — Standard deviation of 2D matrix elements
    - stdev2 — Standard deviation of 2D matrix elements
- Image Arithmetic
    - imabsdiff — Calculate absolute difference of two images
    - imadd — Add two images or add a constant to an image
    - imcomplement — Complement image
    - imdivide — Divide two images or divide an image by an constant.
    - imlincomb — Linear combination of images
    - immultiply — Multiply two images or multiply an image by an constant.
    - imsubtract — Subtract two images or subtract a constant from an image
- Image Block Processing
    - im2col — Convert image into series of columns
    - imblockproc — Distict block processing for an image
    - imblockslide — Sliding block processing for an image
    - imcolproc — Sliding block processing for an image, with vectorization
- Image Enhancement and Restoration
    - imadjust — Adjust the intensity of an image from given source histogram range to the destination histogram range
    - imdeconvl2 — Deconvolution with L2 Regularization
    - imdeconvsobolev — Deconvolution by Sobolev Regularization
    - imdeconvwiener — Deconvolution with Wiener method
    - imdecorrstretch — Apply decorrelation stretch to multichannel image
    - imhistequal — Histogram Equalization
    - iminpaint — Restores the selected region in an image using the region neighborhood
    - immedian — Image median filter
    - imnoise — Add noise (gaussian, etc.) to an image
    - imwiener2 — Wiener filter for image
- Image Linear Filtering
    - filter2 — 2D digital filtering
    - fspecial — Create some 2D special filters
    - imfilter — Image filtering
- Image Reading, Display and Exploration
    - imcreatechecker —
    - imdestroy — Destroy graphic window created using imdisplay (highgui).
    - imdestroyall — Destroy ALL graphic window created using imdisplay (highgui).
    - imdisplay — Display image using highgui for faster frame rate
    - imread — Reads image file
    - imshow — Display image in graphic window
    - imwrite — Write image to file
    - tifread — Special function to read 12-bits 1024x1024 CCD image
- Image Registration and Image Fusion
    - imfuse — Image fusion
    - imgettransform — Get transformation matrix from given source and destination points
    - imtransform — Image affine transformation
    - warpmatselect — Selecting points for image transformation
- Image Stitching
    - imstitchimage — Stitch Images Stored in List
    - imstitchimage_params — Image Stitching Parameters
- Image Transforms
    - imdct — Discrete cosine transform (DCT)

    - imhough — Image Hough transformation
    - imhoughc — Image Hough transformation for Circle Detection
    - imidct — Inverse discrete cosine transform (DCT)
    - imlogpolar — Remaps an image to log-polar space.
    - imradon — Calculates the 2D-Radon transform of the matrix
- Image Types and Color Space Conversions
    - hsv2rgb — Convert a HSV image to the equivalent RGB image.
    - hsv2rgb2 — Convert a HSV image to the equivalent RGB image.
    - im2bw — Convert image to binary
    - im2double — Convert image to double precision
    - im2int16 — Convert image to 16-bit signed integers
    - im2int32 — Convert image to 32-bit signed integers
    - im2int8 — Convert image to 8-bit signed integers
    - im2uint16 — Convert image to 16-bit unsigned integers
    - im2uint8 — Convert image to 8-bit unsigned integers
    - imgraythresh — Calculate Otsu's Global threshold value
    - imnorm — Normalize input 2-D Image to the range of 0-1 for double, or 0-255 for uint8
    - ind2rgb — Convert index image to RGB image
    - mat2gray — Convert matrix to grayscale image
    - ntsc2rgb — Convert a NTSC image to the equivalent RGB image.
    - rgb2gray — Convert RGB images to gray images
    - rgb2hsv — Convert a RGB image to the equivalent HSV image
    - rgb2ind — Convert RGB image to index image
    - rgb2lab — Convert from RGB color space to LAB color space
    - rgb2ntsc — Convert a RGB image to the equivalent NTSC image YIQ.
    - rgb2ycbcr — Convert a RGB image to the equivalent YCbCr image.
    - xs2im — Convert graphics to an image matrix.
    - ycbcr2rgb — Convert a YCbCr image to the equivalent RGB image.
- Morphological Operations
    - bwborder — Find border for an image
    - imblackhat — Image blackhat
    - imblobprop — Calculate blobs properties from labeled image
    - imclose — Image closing
    - imcreatese — Creating Structure Element for Morphological operation
    - imdilate — Image dilation
    - imerode — Image erosion
    - imfill — Filling holes for objects in a binary image
    - imgradient — Image gradient
    - imhitmiss — Image Hit-Miss
    - imlabel — Find blobs in an image
    - imopen — Image opening
    - imtophat — Image tophat
- Object Detection
    - imdetectobjects — Detect Objects In an Image with Cascade Classification
- Object Tracking
    - imtrack_init — Initialize Tracker
    - imtrack_unloadall — Unload All Trackers
    - imtrack_update — Update Tracker
- ROI Processing
    - imroifill — Fill and image using the border color of the selected region
    - imroifilt — Filtering of a selected region
- Spatial Transformations
    - imcrop — Crop image
    - imcropm — Crop an image using mouse selection
    - impyramid — Image pyramid reduction and expansion

    - imresize — Resizes image
    - imrotate — Rotate an image to given angle
- Structural Analysis and Shape Descriptors
    - imconvexHull — Finds the convex hull of a point set.
    - imdrawcontours — Draw contours from the contour image.
    - imfindcontours — Finds contours in a binary image.
- Super Resolution
    - imsuperres — Super Resolution with Image Sequences
    - imsuperres_params — Super Resolution with Image Sequences Parameters
- Utilities and Interactive Tools
    - im2movie — Create movie from sequence of images
    - imaddtext — Adding text to a color image
    - imbreakset — Set the break event with Scilab figure
    - imbreakunset — Unset the break event with Scilab figure
    - imcaminfo — Show the supported raw resolution for an USB camera (linux only)
    - imchoose — Choose a bounding box with mouse
    - imdistline — Measure distance between 2 selected points in pixels.
    - imlsusb — List all USB devices connected to PC (linux only)
    - impixelval — Interactive tool to inspect pixel value at selected point
    - imrects — Draw Bounding Boxes on An Image
    - imroi — Select region of interest and create a mask from it
    - imselect — Select points on an image.
    - rectangle — Draw a rectangle on image
- Video Handling
    - addframe — Add a frame to the video file. (Depreciated. Replaced by aviaddframe.)
    - aviaddframe — Add a frame to the video file.
    - aviclose — Close a video file.
    - avicloseall — Close all opened video files/cameras.
    - avifile — Create a new video file to write.
    - aviinfo — Retrieve video file information
    - avilistopened — Show all opened video files.
    - aviopen — Open a video file.
    - avireadframe — Grabs and returns a frame from a opened video file or camera.
