Camera Calibration and 3D Reconstruction	
Camera Calibration	distortion and tangential distortion.
Pose Estimation	draw some 2D diagrams in it to simulate the 3D effect
Epipolar Geometry	cv.computeCorrespondEpilines
Depth Map from Stereo Images	if we have two images of same scene, we can get depth information from that in an intuitive way

Computational Photography	
Image Denoising	cv.fastNlMeansDenoising() - works with a single grayscale images cv.fastNlMeansDenoisingColored() - works with a color image. cv.fastNlMeansDenoisingMulti() - works with image sequence captured in short period of time (grayscale images) cv.fastNlMeansDenoisingColoredMulti() - same as above, but for color images.
Image Inpainting	Replace those bad marks with its neighbouring pixels so that it looks like the neighbourhood.
HDR	take photographs of a real world scene, bright regions may be overexposed, while the dark ones may be underexposed

Gui Features	
Images	load an image, display it and save it
Videos	play videos, capture videos from Camera and write it as a video
Drawing	draw lines, rectangles, ellipses, circles etc
Mouse	Draw stuffs with mouse
Trackbar	Create trackbar to control certain parameters

Feature Detection and Description	
Harris Corner	corners are regions in the image with large variation in intensity
Shi-Tomasi Corner Detector	cv.goodFeaturesToTrack()
SIFT	1. Scale-space Extrema Detection 2. Keypoint Localization 3. Orientation Assignment4. Keypoint Descriptor 5. Keypoint Matching
SURF	a speeded-up version of SIFT
FAST	a real-time application
BRIEF	a faster method feature descriptor calculation and matching.
ORB (Oriented FAST and Rotated BRIEF)	ORB is basically a fusion of FAST keypoint detector and BRIEF descriptor with many modifications to enhance the performance. (FREE)

VideoAnalysis	
Meanshift and Camshift	cv.meanShift(dst, track_window, term_crit)、cv.CamShift(dst, track_window, term_crit)
Optical Flow	cv.calcOpticalFlowPyrLK()
Background Subtraction	BackgroundSubtractorMOG 、BackgroundSubtractorMOG2、BackgroundSubtractorGMG

CV Based on DNN	
classfication	Lenet、Alxnet、Vgg series、Resnet series、Inception series、Densenet series、Googlenet、Nasnet、Xception、Senet(state of art)
object detection	CNN 's Two Stage Algorithm:RCNN、SPPNet Faster RCNN、Feature Pyramid Network CNN's One Stage Algorithm:YOLO series、SSD series、RetinaNet series
Segmentation	Fully Convolutional Networks 、Convolutional Models With Graphical Models、Encoder-Decoder Based Models、Multi-Scale and Pyramid Network Based Models、R-CNN Based Models 、Dilated Convolutional Models and DeepLab Family、Recurrent Neural Network Based Models、Attention-Based Models、Generative Models and Adversarial Training、CNN Models With Active Contour Models

Image Processing	
Changing Colorspaces	convert images from one color-space to another, like BGR<-> Gray, BGR <->HSV etc.
Geometric Transformations	s like translation, rotation, affine transformation etc
Thresholding	Simple thresholding, Adaptive thresholding, Otsu's thresholding
Filtering	LPF helps in removing noises, blurring the images etc. HPF filters helps in finding edges in the images.
Morphological	like Erosion, Dilation, Opening, Closing
Gradients	Sobel, Scharr and Laplacian
Canny Edge Detection	a multi-stage algorithm Noise Reduction Finding Intensity Gradient of the Image Non-maximum Suppression
Pyramids	work with (the same) images in different resolution.
Contours	rectangle etc. Properties: like Solidity, Mean Intensity etc Hierarchy: i.e. the parent-child relationship in Contours.
Histograms	Histogram Equalization Histograms histogram backprojection to segment colored objects
Transforms	like Fourier Transform, Cosine Transform
Template Matching	search for an object in an image
Hough Line Transform	detect lines
Hough Circle Transform	detect circles
Image Segmentation with Watershed Algorithm	Any grayscale image can be viewed as a topographic surface where high intensity denotes peaks and hills while low intensity denotes valleys
Foreground Extraction	"GrabCut": interactive foreground extraction using iterated graph cuts