Image filtering

Image pyramids

Image gradients

Boundaries

Hough Transform

Image Manipulation (January)
Corner detection  Multi-scale detection

Haar-like  HOG  SURF  SIFT

Image Features (February)
Object Recognition

Bag-of-words
K-means

Nearest Neighbor
Naive Bayes
SVM

Object Recognition (February)
Convolutional Neural Networks (February)

Perceptron

Gradient Decent

Convolutional Neural Networks (February)
2D Transforms

DLT

RANSAC

Homography

2D Alignment (March)
2 view geometry (March)
Stereo Rectification

Block matching

Energy minimization

Stereo (April)
Optical Flow

Constant Flow

Horn-Schunck

Optical Flow (April)
Lucas-Kanade (Forward additive)

Baker-Matthews (Inverse Compositional)

Image Alignment (April)
Tracking in Video (April)

KLT

Mean shift

Kalman Filtering

SLAM
What you can do now

- Detect lines (circles, shapes) in an image
- Recognize objects using a bag-of-words model
- Recognize using Deep Convolutional Neural Networks
- Automatic image warping (homography) and basic AR
- Reconstruct 3D scene structure from two images
- Track objects in video (LK, Mean-Shift)