Kalman filter comparison

1) Mouse Example

- KF = KalmanFilter(4, 2, 0); // KalmanFilter (int dynamParams, int measureParams, int controlParams=0,..)
- Observation : Position (x, y)
- State prediction: Linear target motion

- Transition Matrix

= Description of dynamics

- Transition Matrix, A

```
KF.transitionMatrix (4x4)
1.00    0.00    1.50    0.00
0.00    1.00    0.00    1.50
0.00    0.00    1.00    0.00
0.00    0.00    0.00    1.00
```

- Measurement Matrix, H

```
KF.measurementMatrix (2x4)
1.00    0.00    0.00    0.00
0.00    1.00    0.00    0.00
```

2) Velocity model example

- Kalman-Simple-CV.ipynb

```
A = np.matrix([[1.0, 0.0, dt, 0.0],
               [0.0, 1.0, 0.0, dt],
               [0.0, 0.0, 1.0, 0.0],
               [0.0, 0.0, 0.0, 1.0]])
```

- Measurement Matrix H

directly measure the Velocity $\dot{x}$ and $\dot{y}$

$$H = \begin{bmatrix} 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 1 \end{bmatrix}$$

3) OpenCV (1-D Tracking of rotating point)

- Transition Matrix, A

KF.transitionMatrix [1, 1; 0, 1]

$$A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$$

- Measurement Matrix, H

KF.measurementMatrix

= [1, 0]

$$H = \begin{bmatrix} 1 & 0 \end{bmatrix}$$

In [ ]: