System equation $\quad x(k+1) = \Phi\, x(k) + \Gamma\, w(k)$

measurement equation $\quad z(k) = h(x(k)) + v(k)$

$$Z^k : (z(k), z(k-1) \cdots z(0))'$$

Complete description of the state is given by the a posterior density func.

$$f(x(k) \mid Z^k)$$

provided that the noise is white and uncorrelated

I. Measurement update equation

$$f(X(k) \mid Z^k) = \frac{1}{c} f(X(k) \mid Z^{k-1})\, f(z(k) \mid X(k))$$

II Time update equation

$$f(X(k) \mid Z^{k-1}) = \int_{-\infty}^{\infty} f(X(k) \mid X(k-1))\, f(X(k-1) \mid Z^{k-1})\, dX(k-1)$$

In both I and II, we use the facts that

If all density functions are unimodal Gaussian, then we can derive the KF

$$f(z(k) \mid X(k)\, Z^{k-1}) = f(z(k) \mid X(k))$$

$$f(X(k) \mid X(k-1)\, Z^{k-1}) = f(X(k) \mid X(k-1))$$

$$f(X(k) \mid X(k-1) \cdots X(0)) = f(X(k) \mid X(k-1))$$

pf for I :

$$f(X(k) \mid Z(k)\, Z^{k-1}) = \frac{f(X(k)\, z(k)\, Z^{k-1})}{f(Z^k)} = \frac{f(X(k)\, z(k)\, Z^{k-1})}{f(X(k)\, Z^{k-1})} \frac{f(X(k)\, Z^{k-1})}{f(Z^k)}$$

$$= \frac{f(Z^{k-1})}{f(Z^k)} f(X(k) \mid Z^{k-1})\, f(z(k) \mid X(k)\, \cancel{Z^{k-1}})$$

pf for II :

$$f(X(k) \mid X(k-1))\, f(X(k-1) \mid Z^{k-1})$$

$$= f(X(k) \mid X(k-1)\, Z^{k-1})\, f(X(k-1) \mid Z^{k-1})$$

$$= f(X(k)\, X(k-1) \mid Z^{k-1})$$

System equation $\quad x(k+1) = \Phi\, x(k) + \Gamma\, w(k)$

measurement equation $\quad z(k) = h(x(k)) + v(k)$

$$Z^k = (z(k), z(k-1) \cdots z(0))'$$

Complete description of the state is given by the a posterior density func.

$$f(x(k) \mid Z^k)$$

provided that the noise is white and uncorrelated

I. Measurement update equation

$$f(x(k) \mid Z^k) = \frac{1}{c} f(x(k) \mid Z^{k-1})\, f(z(k) \mid x(k))$$

II Time update equation

$$f(x(k) \mid Z^{k-1}) = \int_{-\infty}^{\infty} f(x(k) \mid x(k-1))\, f(x(k-1) \mid Z^{k-1})\, dx(k-1)$$

If all density functions are unimodal Gaussians, then we can derive the KF

In both I and II, we use the facts that

$$f(z(k) \mid x(k)\ Z^{k-1}) = f(z(k) \mid x(k))$$

$$f(x(k) \mid x(k-1)\ Z^{k-1}) = f(x(k) \mid x(k-1))$$

$$f(x(k) \mid x(k-1) \cdots x(0)) = f(x(k) \mid x(k-1))$$

pf for I: $\quad f(x(k) \mid z(k)\, Z^{k-1}) = \dfrac{f(x(k)\, z(k)\, Z^{k-1})}{f(Z^k)} = \dfrac{f(x(k)\, z(k)\, Z^{k-1})}{f(x(k)\, Z^{k-1})} \dfrac{f(x(k)\, Z^{k-1})}{f(Z^k)}$

$$= \frac{f(Z^{k-1})}{f(Z^k)} f(x(k) \mid Z^{k-1})\, f(z(k) \mid x(k)\, \cancel{Z^{k-1}})$$

pf for II: $\quad f(x(k) \mid x(k-1))\, f(x(k-1) \mid Z^{k-1})$

$$= f(x(k) \mid x(k-1)\, Z^{k-1})\, f(x(k-1) \mid Z^{k-1})$$

$$= f(x(k)\, x(k-1) \mid Z^{k-1})$$

拖曳控制點即可調整邊框。您也可以稍後再使用「⌐」工具加以調整。

重新拍攝 繼續

System equation $\quad x(k+1) = \Phi\, x(k) + \Gamma\, w(k)$

measurement equation $\quad z(k) = h(x(k)) + v(k)$

$$Z^k = (z(k), z(k-1) \cdots z(0))'$$

Complete description of the state is given by the a posterior density func.

$$f(x(k) \mid Z^k)$$

provided that the noise is white and uncorrelated

I. Measurement update equation

$$f(X(K) \mid Z^K) = \frac{1}{c} f(X(K) \mid Z^{K-1})\, f(Z(K) \mid X(K))$$

II Time update equation

$$f(X(K) \mid Z^{K-1}) = \int_{-\infty}^{\infty} f(X(K) \mid X(K-1))\, f(X(K-1) \mid Z^{K-1})\, dX(K-1)$$

In both I and II, we use the facts that

If all density functions are unimodal Gaussian, then we can derive the KF

$$f(Z(K) \mid X(K)\ Z^{K-1}) = f(Z(K) \mid X(K))$$

$$f(X(K) \mid X(K-1)\ Z^{K-1}) = f(X(K) \mid X(K-1))$$

$$f(X(K) \mid X(K-1) \cdots X(0)) = f(X(K) \mid X(K-1))$$

pf for I: $\quad f(X(K) \mid Z(K)\, Z^{K-1}) = \dfrac{f(X(K)\, Z(K)\, Z^{K-1})}{f(Z^K)} = \dfrac{f(X(K)\, Z(K)\, Z^{K-1})}{f(X(K)\, Z^{K-1})} \dfrac{f(X(K)\, Z^{K-1})}{f(Z^K)}$

$$= \frac{f(Z^{K-1})}{f(Z^K)} f(X(K) \mid Z^{K-1})\, f(Z(K) \mid X(K)\, \cancel{Z^{K-1}})$$

pf for II: $\quad f(X(K) \mid X(K-1))\, f(X(K-1) \mid Z^{K-1})$

$$= f(X(K) \mid X(K-1)\, Z^{K-1})\, f(X(K-1) \mid Z^{K-1})$$

$$= f(X(K)\, X(K-1) \mid Z^{K-1})$$

System equation $\quad x(k+1) = \Phi x(k) + \Gamma w(k)$

measurement equation $\quad z(k) = h(x(k)) + v(k)$

$$Z^k = (z(k), z(k-1) \cdots z(0))'$$

Complete description of the state is given by the a posterior density func.

$$f(x(k) \mid Z^k)$$

provided that the noise is white and uncorrelated

I. Measurement update equation

$$f(x(k) \mid Z^k) = \frac{1}{c} f(x(k) \mid Z^{k-1})\, f(z(k) \mid x(k))$$

II Time update equation

$$f(x(k) \mid Z^{k-1}) = \int_{-\infty}^{\infty} f(x(k) \mid x(k-1))\, f(x(k-1) \mid Z^{k-1})\, dx(k-1)$$

In both I and II, we use the facts that

If all density functions are unimodal Gaussian, then we can derive the KF

$$f(z(k) \mid x(k)\, Z^{k-1}) = f(z(k) \mid x(k))$$

$$f(x(k) \mid x(k-1)\, Z^{k-1}) = f(x(k) \mid x(k-1))$$

$$f(x(k) \mid x(k-1) \cdots x(0)) = f(x(k) \mid x(k-1))$$

pf for I: $\quad f(x(k) \mid z(k)\, Z^{k-1}) = \dfrac{f(x(k)\, z(k)\, Z^{k-1})}{f(Z^k)} = \dfrac{f(x(k)\, z(k)\, Z^{k-1})}{f(x(k)\, Z^{k-1})} \dfrac{f(x(k)\, Z^{k-1})}{f(Z^k)}$

$$= \frac{f(Z^{k-1})}{f(Z^k)} f(x(k) \mid Z^{k-1})\, f(z(k) \mid x(k)\, \cancel{Z^{k-1}})$$

pf for II: $\quad f(x(k) \mid x(k-1))\, f(x(k-1) \mid Z^{k-1})$

$$= f(x(k) \mid x(k-1)\, Z^{k-1})\, f(x(k-1) \mid Z^{k-1})$$

$$= f(x(k)\, x(k-1) \mid Z^{k-1})$$