$g(x) n(x) x$

x

$Smoothing\ Process \kappa g(x)$

$\alpha = 1,\ \beta = 5$

$Bottom\ Recession\ Process x_2 g(x)$

$\overline{\alpha\,(x_2 - x_{2,min}) + \beta - \gamma g(x) = \{ f\,(x) for f(x) > 0 0 otherwise}$

$\alpha = 10,\ \beta = \gamma = 0.1$

T_i $_shape.pdf$

$_1(s) = \cos(s) 2 T_0(\frac{s-\pi}{\pi}) + T_2 \frac{s-\pi}{\pi}$

$x_2(s) = \sin(s) 2 T_0(\frac{s-\pi}{\pi}) + T_4(\frac{s-\pi}{\pi})$

$x_1, x_2 \in^N N x x_1^T, x_2^T$

$\dot{x} \frac{dx}{dt} Velocity$

$\ddot{x} \frac{d^2x}{dt^2} Acceleration$

$\kappa = \frac{\dot{x} \times \ddot{x}}{\dot{x}^3} Curvature$

$0^2 \mathcal{RFFT} \mathcal{RFFT}$

$s = 2\,\pi\,n/N, for n = 0, , N - 1 s s s 2\pi$

$\mathcal{RFFT} n \log n$

$\dot{x} = \mathcal{RFFT}^{-1} diag(i\,[0 : N/2, 0])\ \mathcal{RFFT}(x)$

$\ddot{x} = \mathcal{RFFT}^{-1} diag(i^2[0 : N/2 + 1]^2)\ \mathcal{RFFT}(x)$

$diag(a) a x_1 x_2 \mathcal{RFFT}(x) [\mathcal{RFFT}(x_1), \mathcal{RFFT}(x_2)]$

$\dot{x}_2, \dot{x}_1]$

$k = \frac{\dot{x}_1 \ddot{x}_2 - \dot{x}_2 \ddot{x}_1}{\dot{x}_1^2 + \dot{x}_2^{2\,3/2}}$

$_lowest_blob_down.pdf$ $s h(s) h(s) = \tilde{s} h(s) = \cos(s)$

$_lowest_blob_bad.pdf$

$h(s)$

$Bottom\ Recession\ Process x_1 x_2 x_1$

$x_1 x_1 Smoothing\ Process x_1 x_2$

$_lowest_blob_bad_x.pdf$

$h(s) h(s)$

$\overline{dt = g(x)\ n + \alpha\ a_t a_t = \frac{\ddot{x} \cdot \dot{x}}{\dot{x}}\ \frac{\dot{x}}{\dot{x}}}$

$a_t \ddot{x} \dot{x} \dot{x} a_t \alpha = 1 a_t g(x) \alpha g(x)$

$_points_blob_good_points.pdf$

$_points_blob_good.pdf$