LELPredictor Neural Network Filter / Amplifer Equations

Parabolic Filter for Molecular Weight

Max/Min/Mean Values

$x_{max} := 1701.2 \qquad x_{min} := 30.026 \qquad x_n := 263.583$

$$x := x_{min}, x_{min} + \frac{x_{max} - x_{min}}{1000} .. x_{max}$$

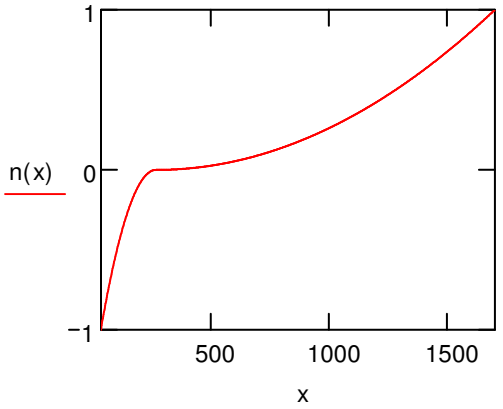
$b := x_n \qquad c1 := 0 \qquad c2 := 0$

$$a1 := \frac{1}{(x_n - x_{min})^2} \qquad a2 := \frac{1}{(x_{max} - b)^2 - (x_n - b)^2}$$

Normalized Parabolic Equations

$$n(x) := \begin{cases} -\left[a1 \cdot (x - b)^2 + c1\right] & \text{if } x < x_n \\ a2 \cdot (x - b)^2 + c2 & \text{otherwise} \end{cases}$$

Normalized Values for Parabolic Filter of Molecular Weight



Parabolic Filter for LEL value

Max/Min/Mean Values

$x_{max} := 6.301$ $x_{min} := -0.301$ $x_n := 3.2614$

$$x := x_{min}, x_{min} + \frac{x_{max} - x_{min}}{1000} .. x_{max}$$

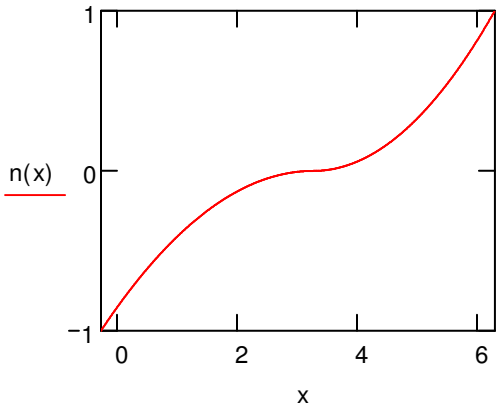
$b := x_n$ $c1 := 0$ $c2 := 0$

$$a1 := \frac{1}{(x_n - x_{min})^2} \qquad a2 := \frac{1}{(x_{max} - b)^2 - (x_n - b)^2}$$

Normalized Parabolic Equations

$$n(x) := \begin{cases} -\left[a1 \cdot (x - b)^2 + c1\right] & \text{if } x < x_n \\ a2 \cdot (x - b)^2 + c2 & \text{otherwise} \end{cases}$$

Normalized Values for Parabolic Filter of the log (-LEL) value



Parabolic Amplifier for LEL value

Restored Values from Normalized Inputs

$$f(y) := \begin{cases} \frac{1}{2 \cdot a2} \cdot \left[2 \cdot a2 \cdot b + 2 \cdot (a2 \cdot y - a2 \cdot c2)^{\frac{1}{2}} \right] & \text{if } y > 0 \\ \frac{1}{2 \cdot a1} \cdot \left[2 \cdot a1 \cdot b - 2 \cdot [(-a1) \cdot y - a1 \cdot c1]^{\frac{1}{2}} \right] & \text{otherwise} \end{cases}$$

$y := -1, -0.999 .. 1$

Restored Values for the Parabolic Amplifier
to calculate the log (-LEL) value
from the NN normalized output (-1 -> 1)