LOCAL REGRESSION OF THE $x \sin\left(\frac{1}{0.1+x^2}\right)$ FUNCTION

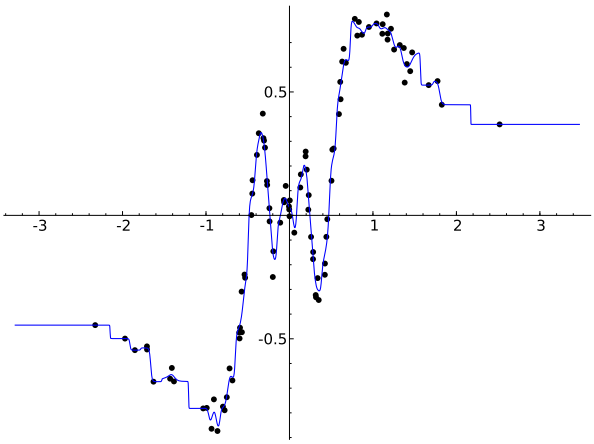

FIGURE 1. Locally constant regression as applied to 100 data points $y_i = x_i \sin\left(\frac{1}{0.1+x_i^2}\right) + 0.05\epsilon_i$ $(i = 1, 2, \ldots, 100)$, the x_i and ϵ_i randomly generated according to the standard normal distribution. A bandwidth of $h = 0.02489$ was chosen by generalized cross-validation. The tanh function is shown in red.

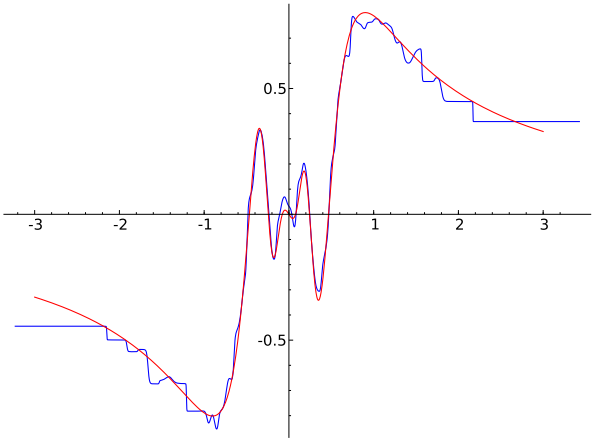

FIGURE 2. Locally constant regression (the blue curve) for the data of the preceding figure, compared with the target function $y = x \sin\left(\frac{1}{0.1+x^2}\right)$ (red curve).

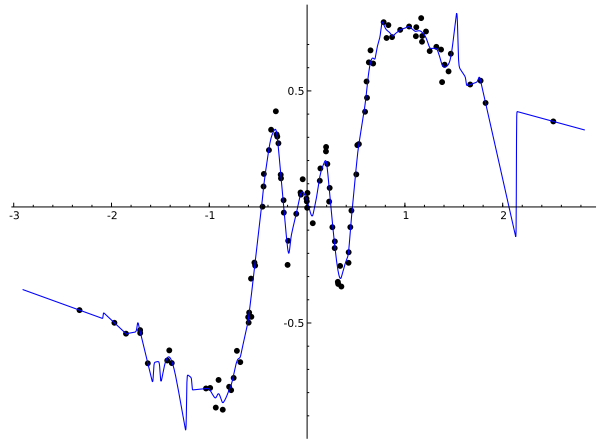

FIGURE 3. Locally linear regression as applied to 100 data points $y_i = x_i \sin\left(\frac{1}{0.1+x_i^2}\right) + 0.05\epsilon_i$ $(i = 1, 2, \ldots, 100)$, the x_i and ϵ_i randomly generated according to the standard normal distribution. A bandwidth of $h = 0.02903$ was chosen by generalized cross-validation. The tanh function is shown in red.

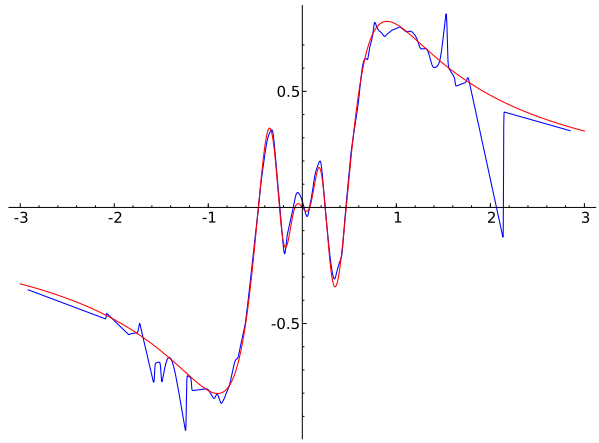

FIGURE 4. Locally linear regression (the blue curve) for the data of the preceding figure, compared with the target function $y = x \sin\left(\frac{1}{0.1+x^2}\right)$ (red curve).