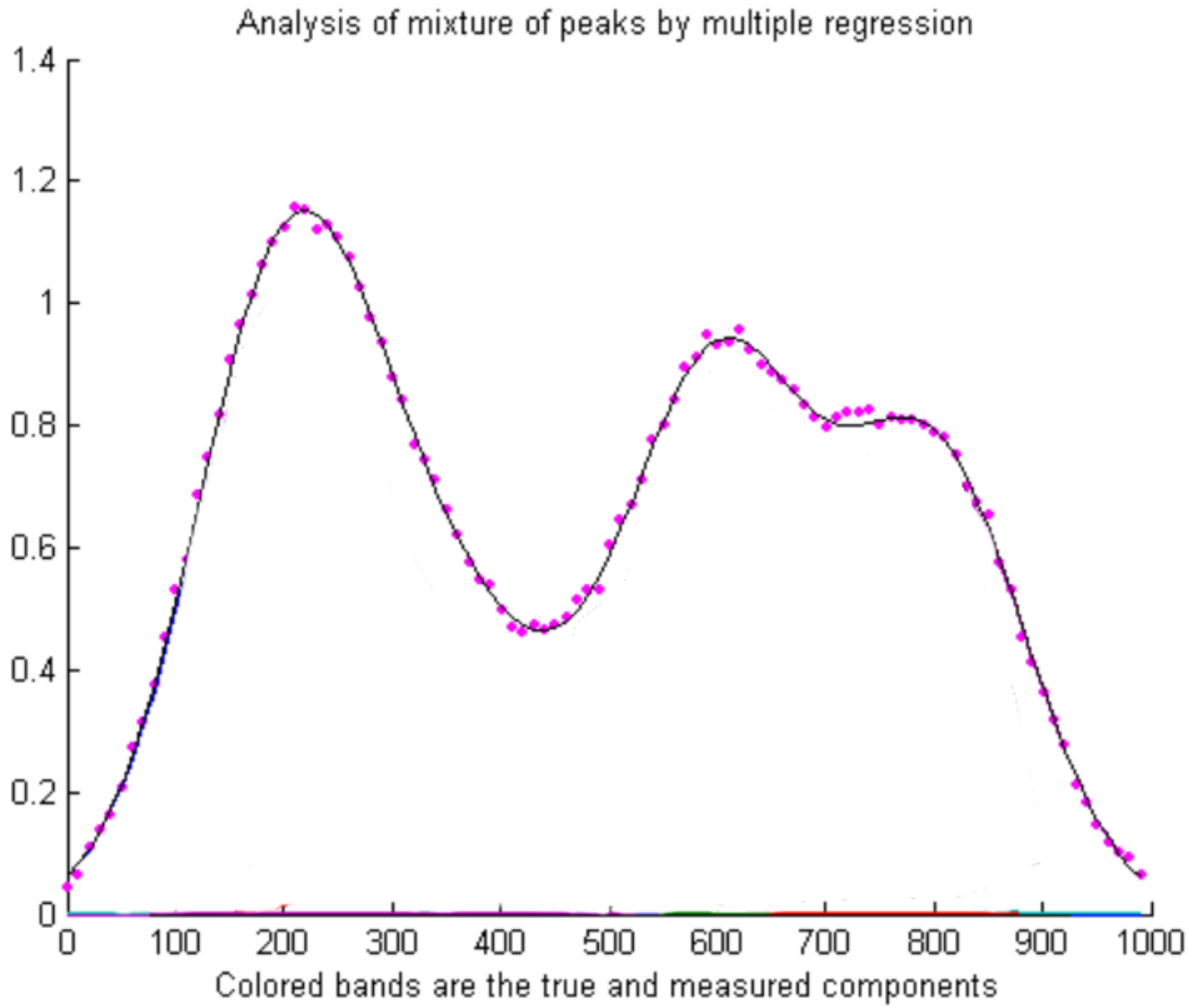
RBFN

Dots = samples

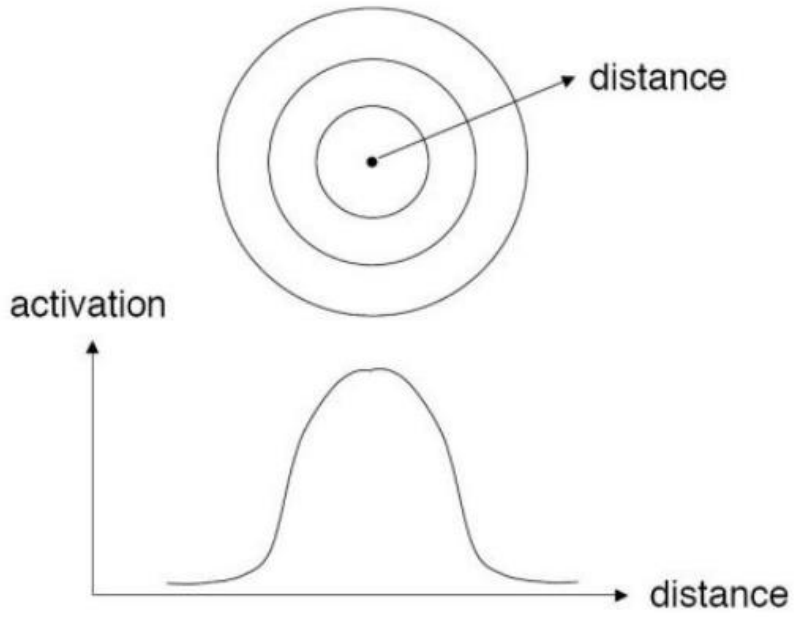
Line = Function we try to approximate



RBFN

- Radial Basis Function

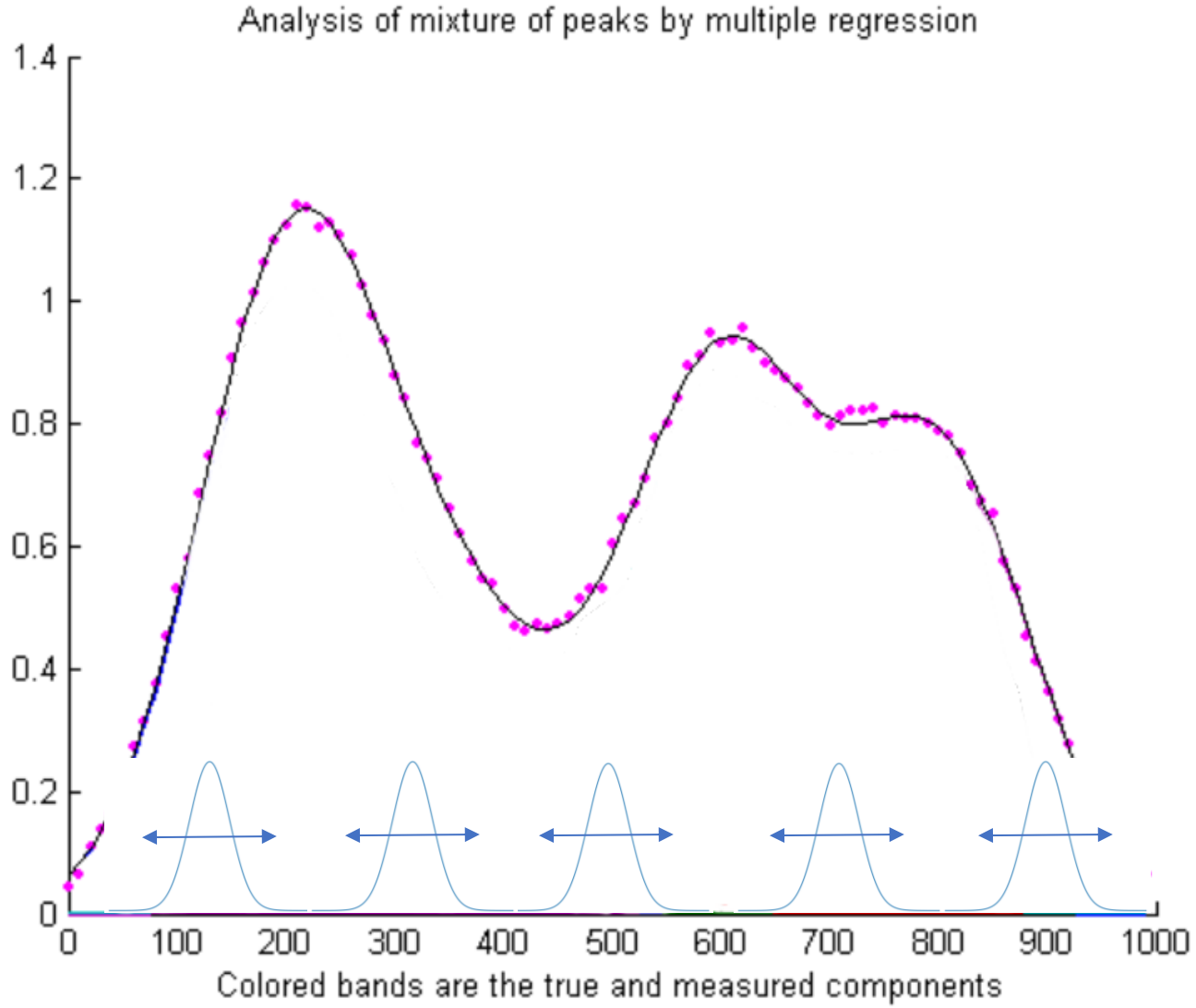
Base = Gaussian Function: $\phi_i(\mathbf{x}, \mathbf{c}^i, \sigma^i) = \exp\left(-\frac{\|\mathbf{x} - \mathbf{c}^i\|^2}{2\sigma^{i2}}\right)$



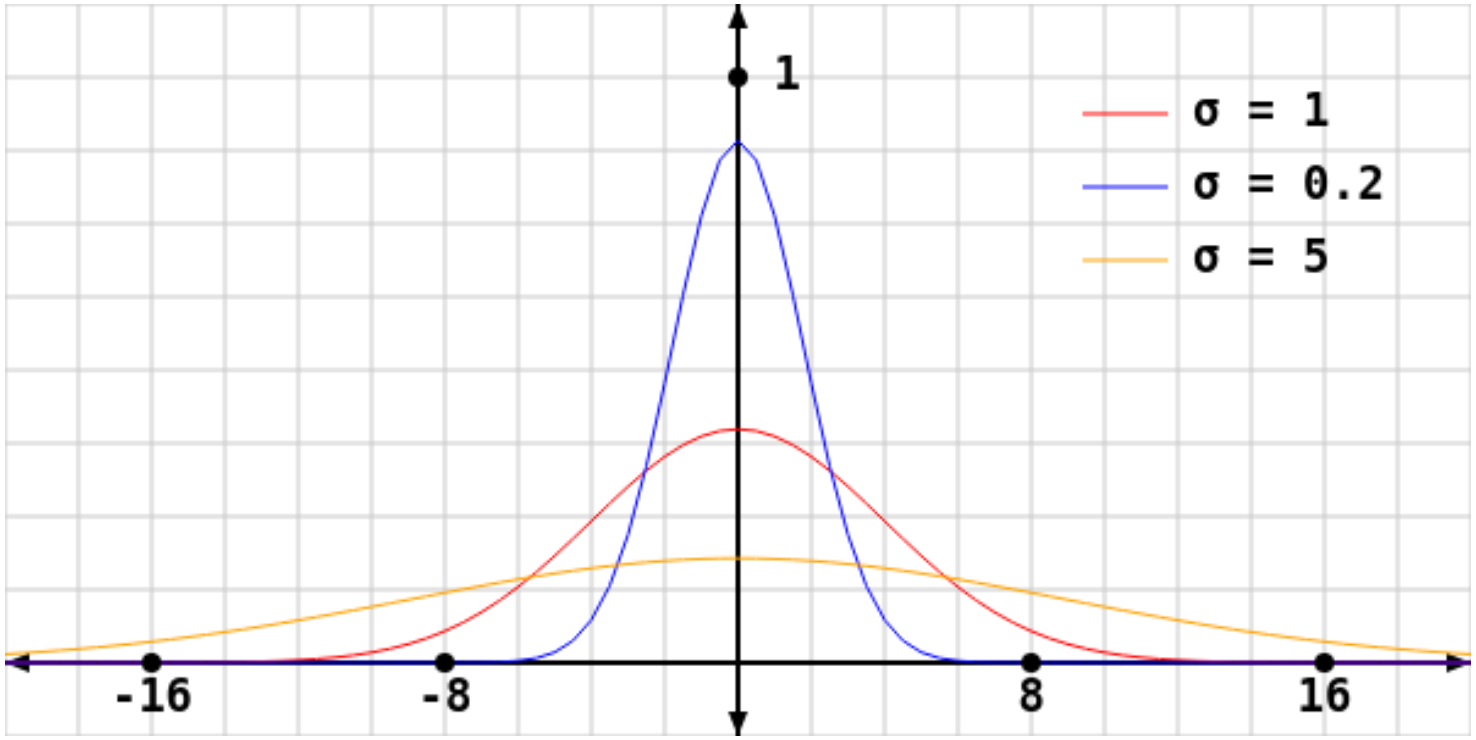
RBFN

- Steps:
    1. Dispatch centers of RBF cleverly.
    2. Define influence area of each RBF.
    3. Apply the RBF on the input.
    4. Learn weights of each RBF if target is considered as the result of a linear combination of RBFs.

1. Dispatch centers of RBF cleverly.



2. Define influence area of each RBF.



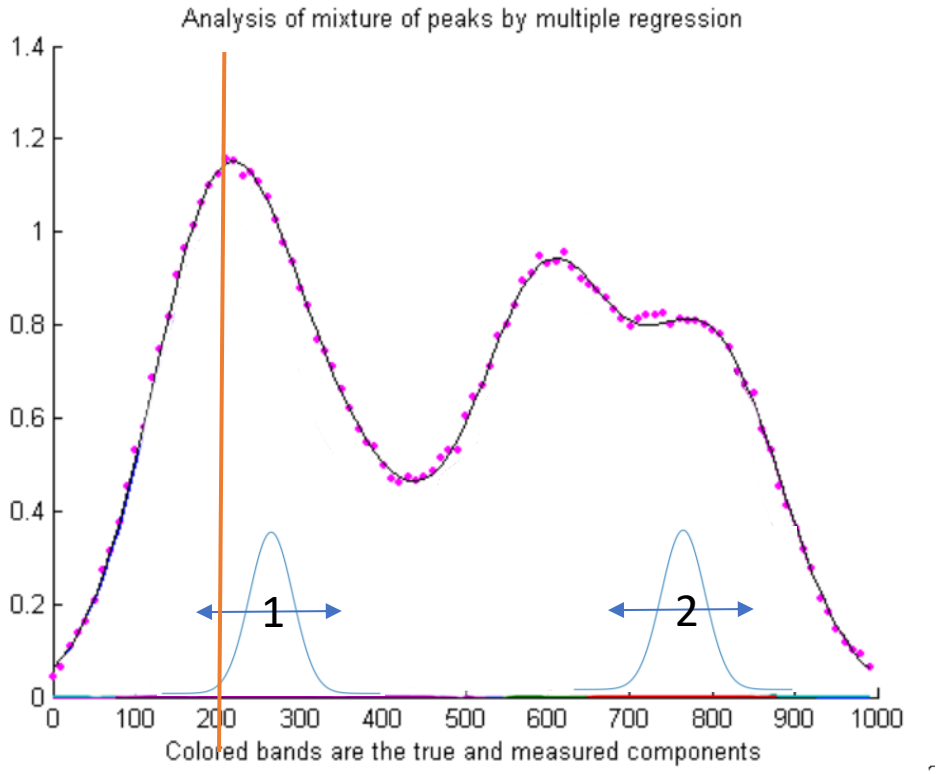
3. Apply the RBFs on the input.

- For every x-coordinate of a purple dot, get the output of each RBF.

- For x=200, which RBF will contibute the most?

$$\phi_i(\mathbf{x}, \mathbf{c}^i, \sigma^i) = \exp_M\left(-\frac{\|\mathbf{x}-\mathbf{c}^i\|^2}{2\sigma^{i2}}\right)$$

$$y = \sum_{i=1} w_i \phi_i(\mathbf{x}) + w_0$$



4. Learn weights of each RBF