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Logistic Regression Based on Homomorphic Encryption

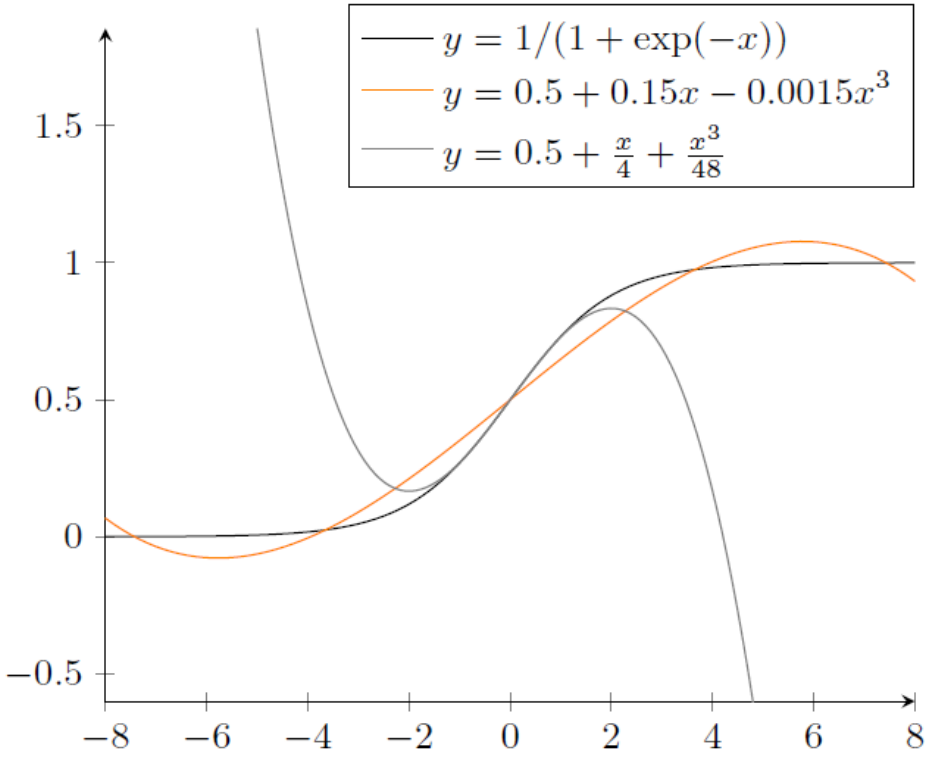

Fig. 2: Sigmoid (the first) and its two approximations using the least squares fitting method (the second) and the Taylor expansion (the third).

- Efficient Logistic Regression on Large Encrypted Data.

Logistic Regression Based on Homomorphic Encryption

$$weights[i] = weights[i] + \alpha \cdot (y_i - sigmoid(z)) \cdot data[i][j]$$

$$\cdots\cdots + \alpha \cdot (y_i - (0.5 + 0.15 \cdot z - 0.0015 \cdot z^3)) \cdot data[i][j]$$

$$z = \langle data[i], weights \rangle$$