Machine Learning

Supervised learning 4: Support Vector Machines

S. Nõmm

[1]Department of Software Science, Tallinn University of Technology

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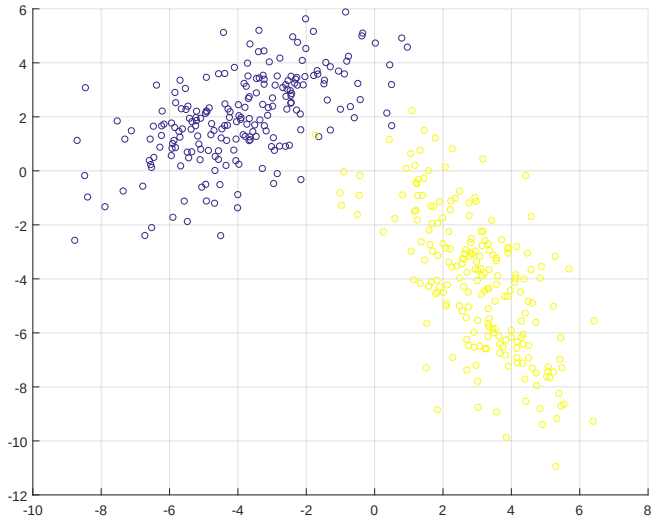
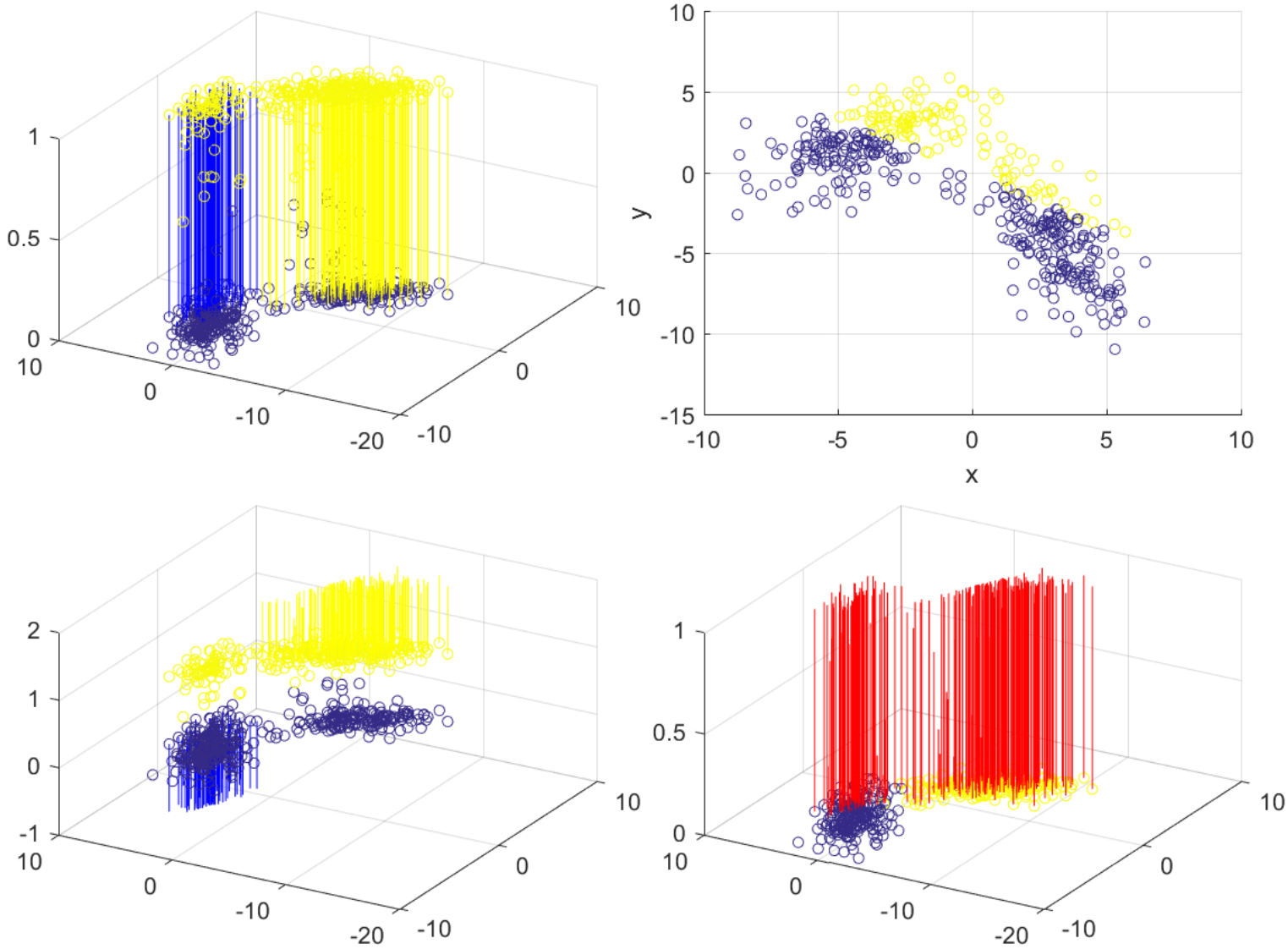
Classification

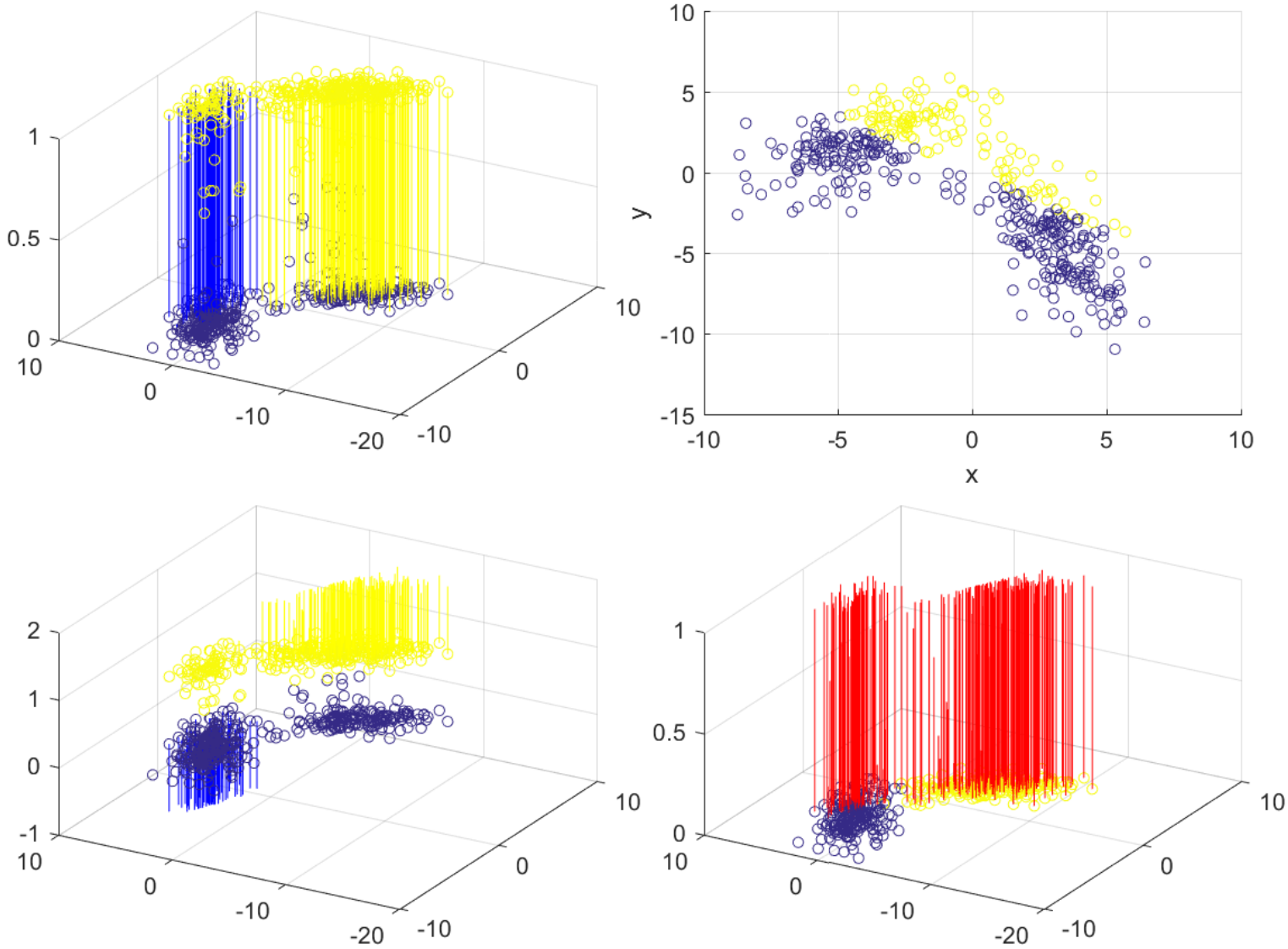
- The goal is to train neural network to classify elements based on their properties.
- Consider example of two sets where the properties of the elements are given by their coordinates.
- Attempt to build a classifier based on a single neuron with two inputs.
- Target (desired output) values are 0 and 1 depending on the class label.



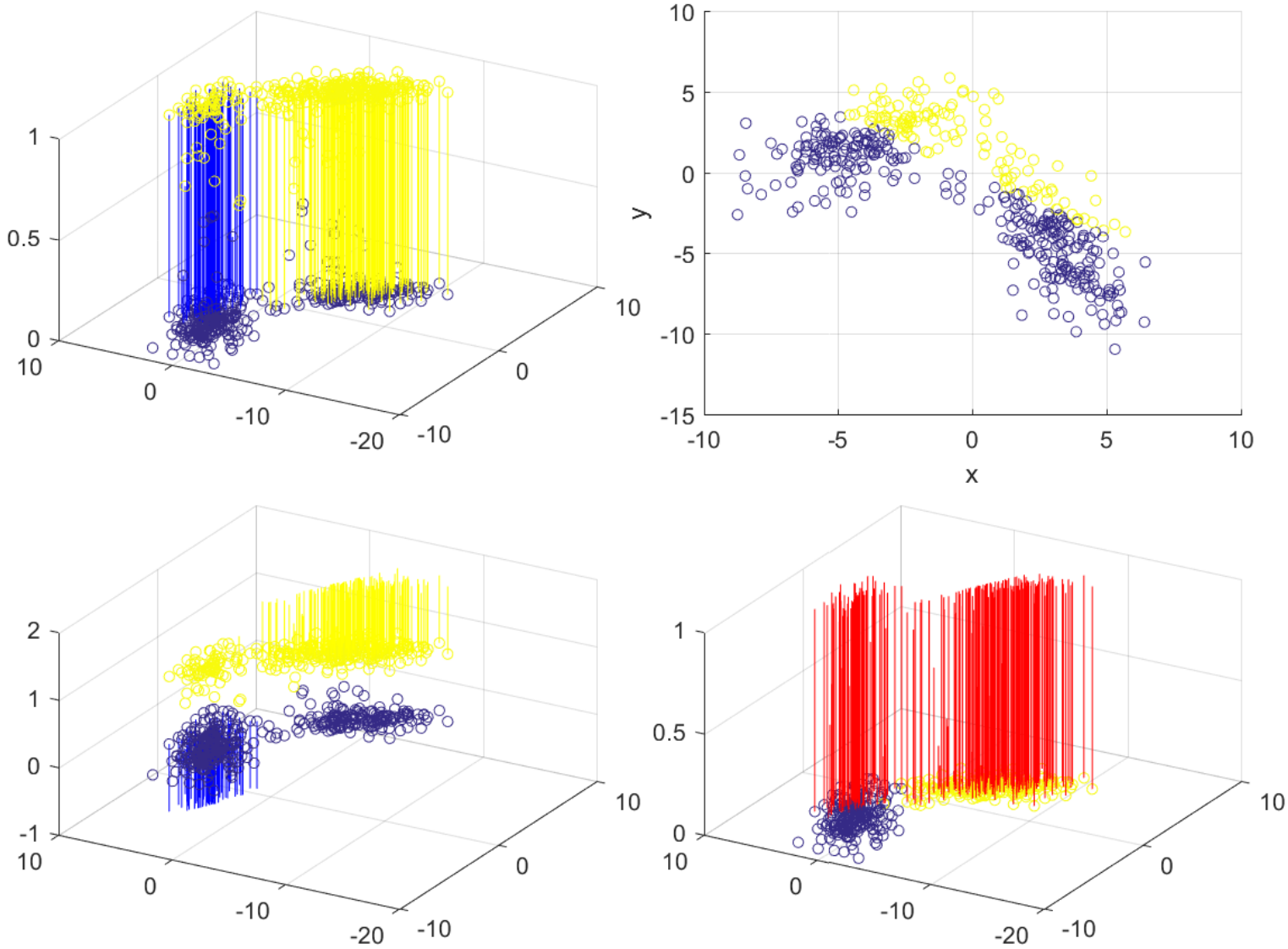
Initial guess, SSR $= 247.45$



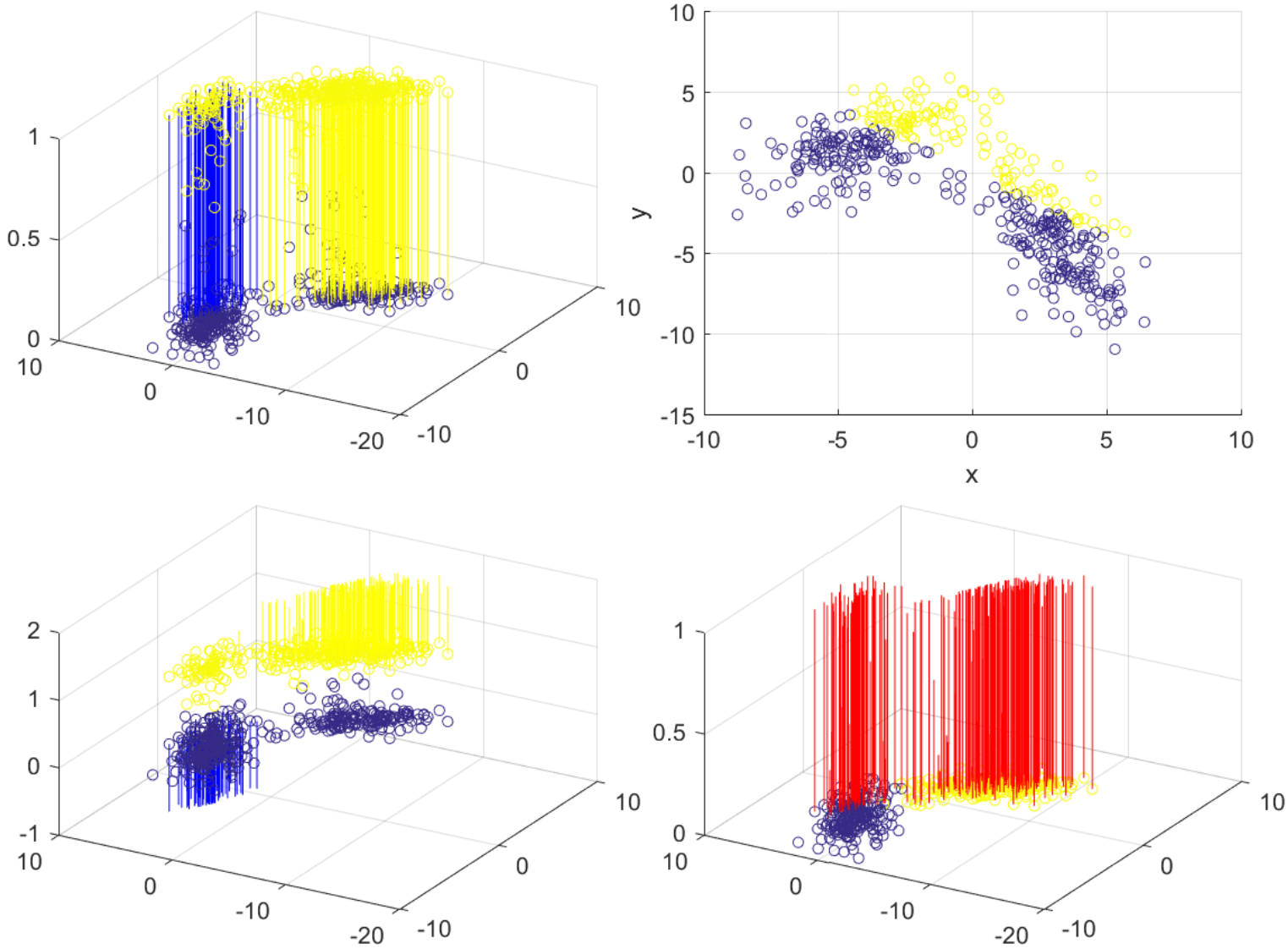
Epoch 2, SSR = 244.47



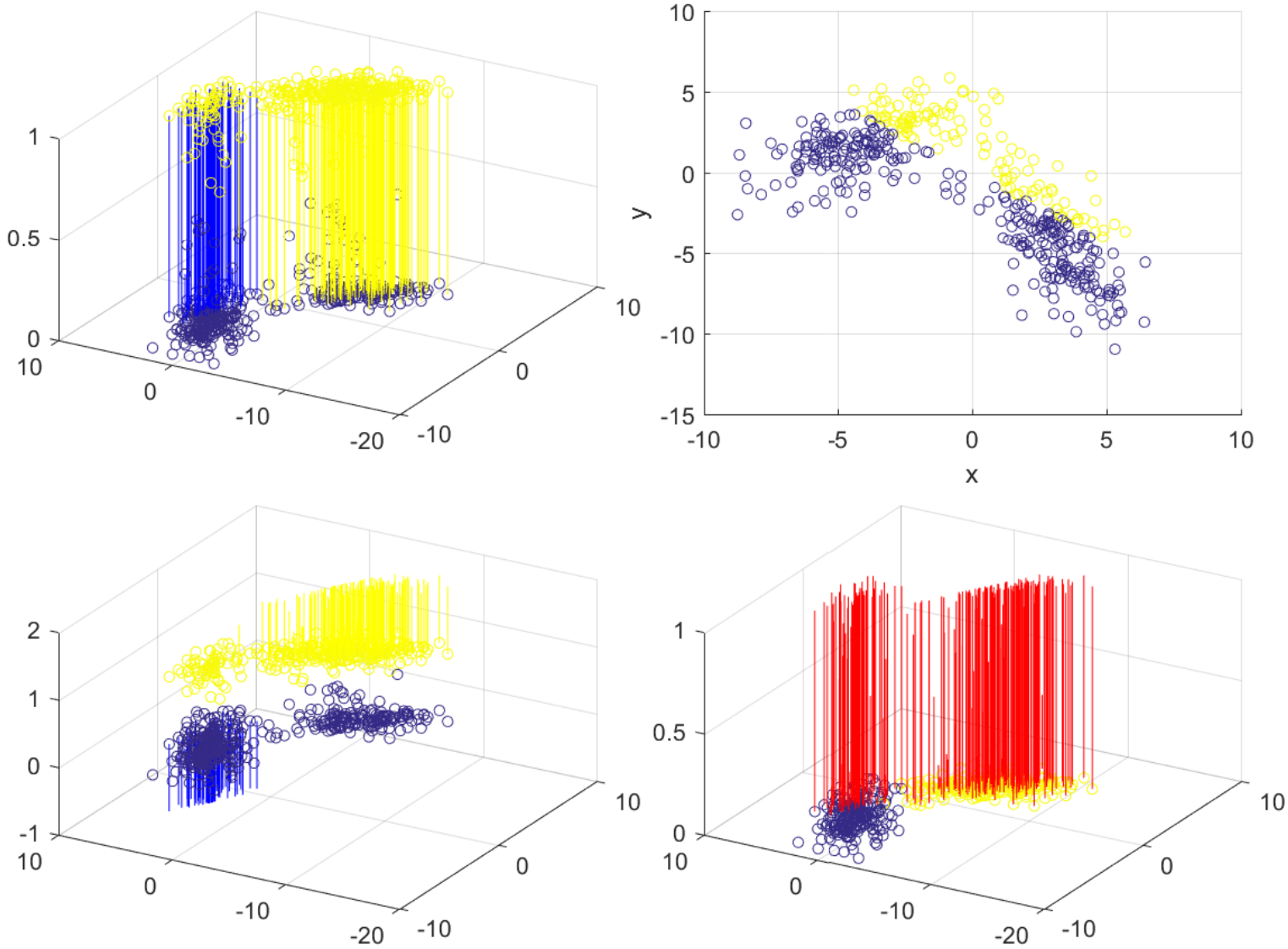
Epoch 4, SSR = 238.82



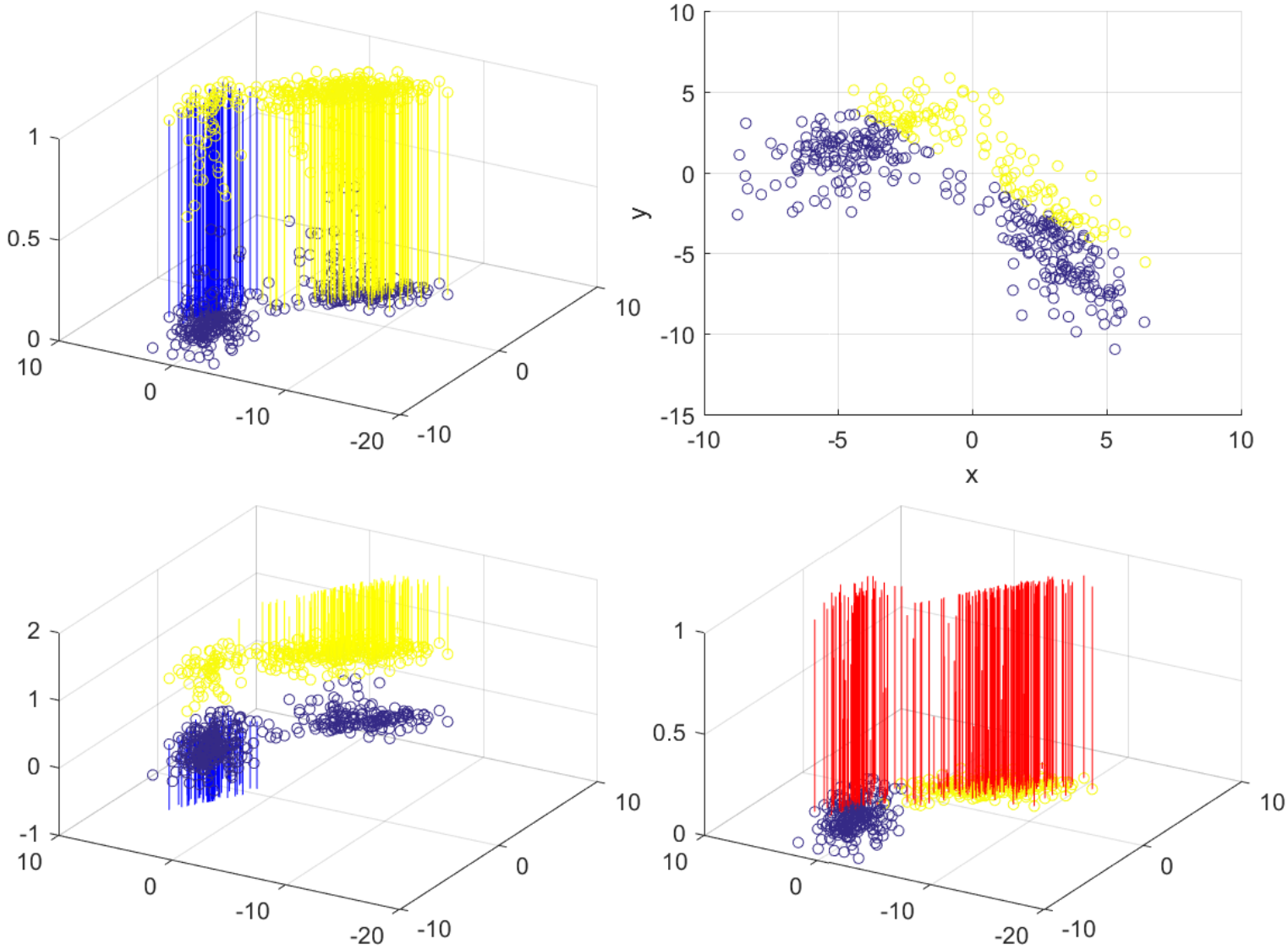
Epoch 6, SSR = 231.98



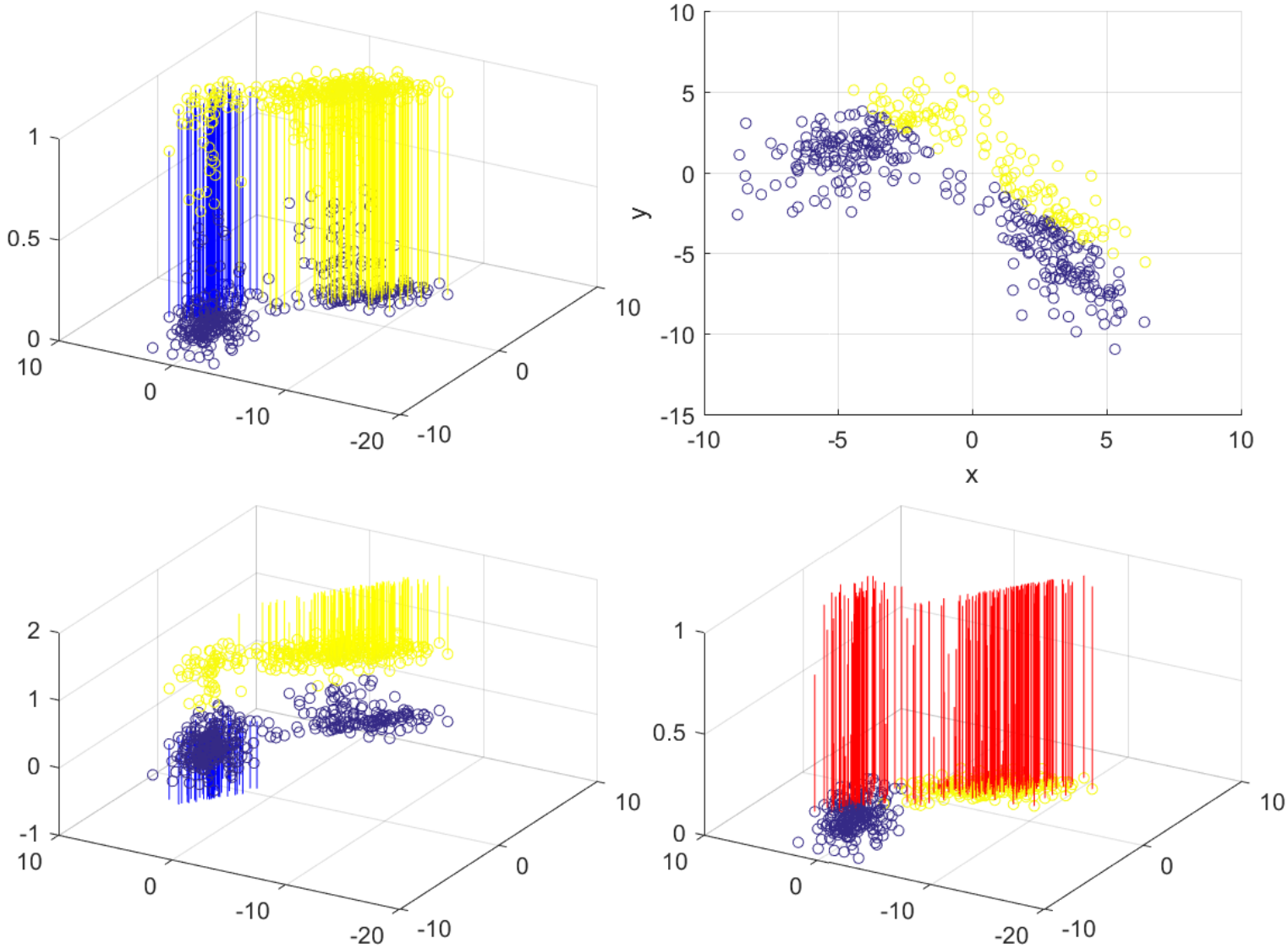
Epoch 8, SSR = 221.03



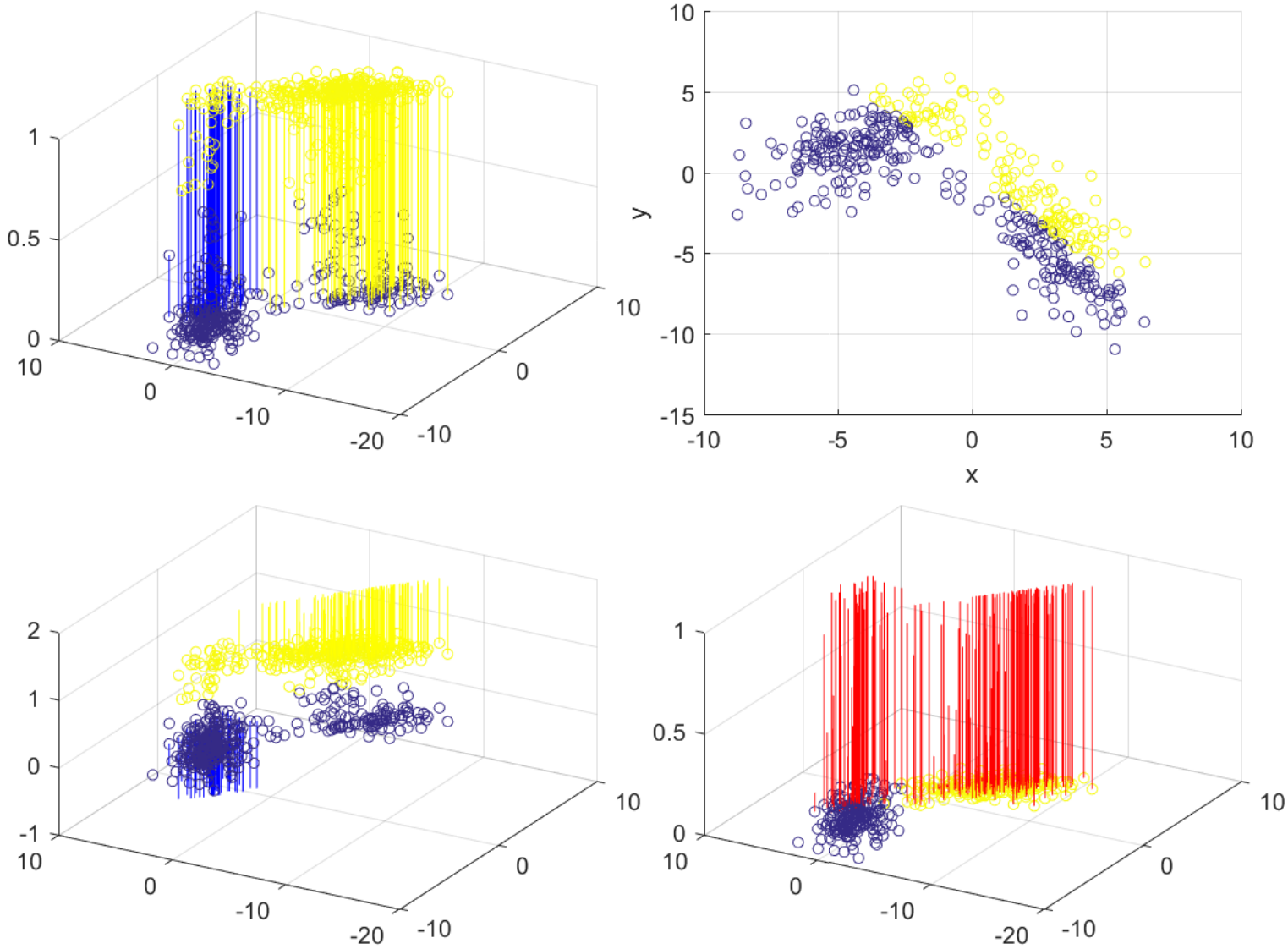
Epoch 10, SSR = 205.61



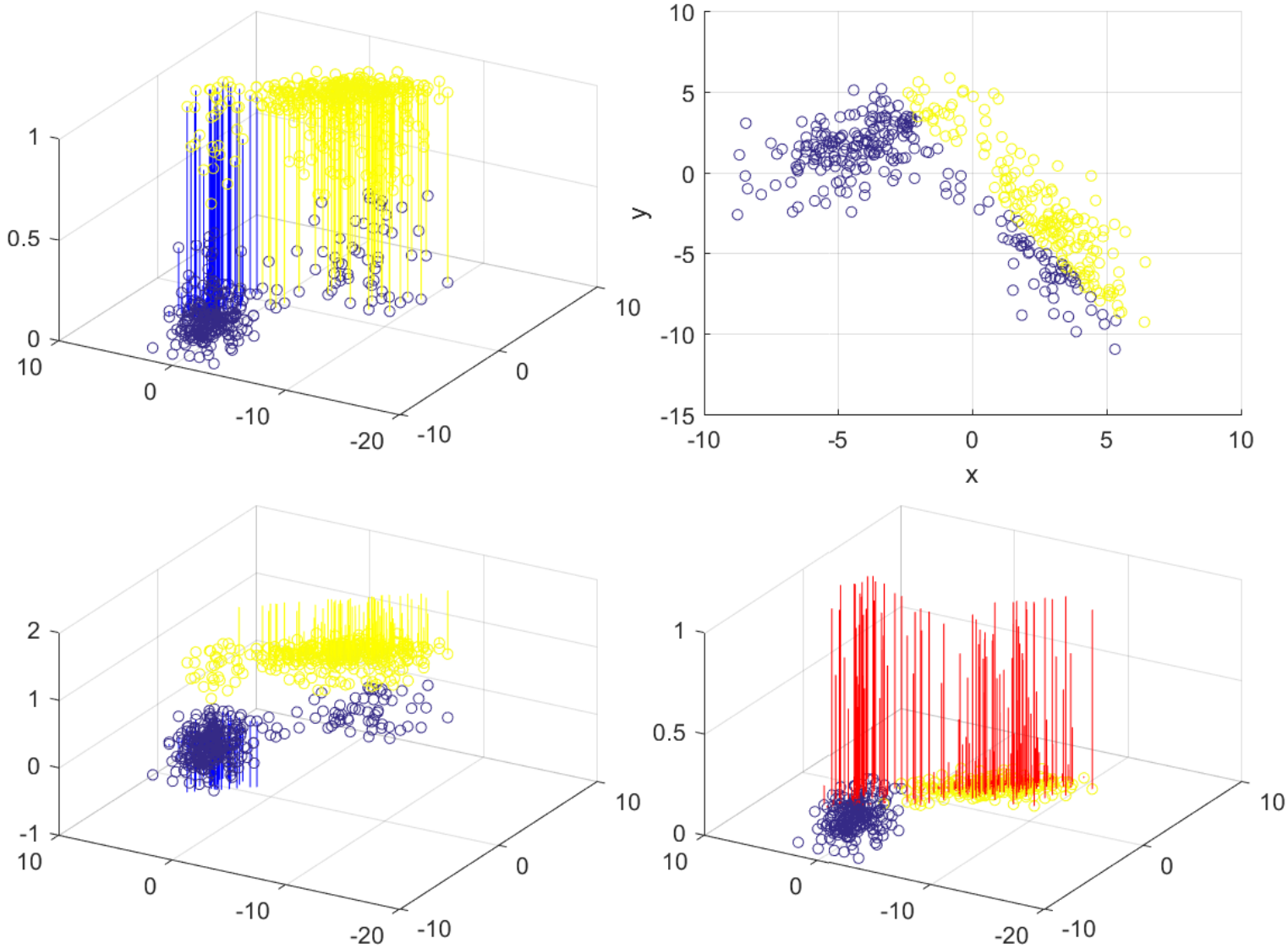
Epoch 12, SSR = 183.14



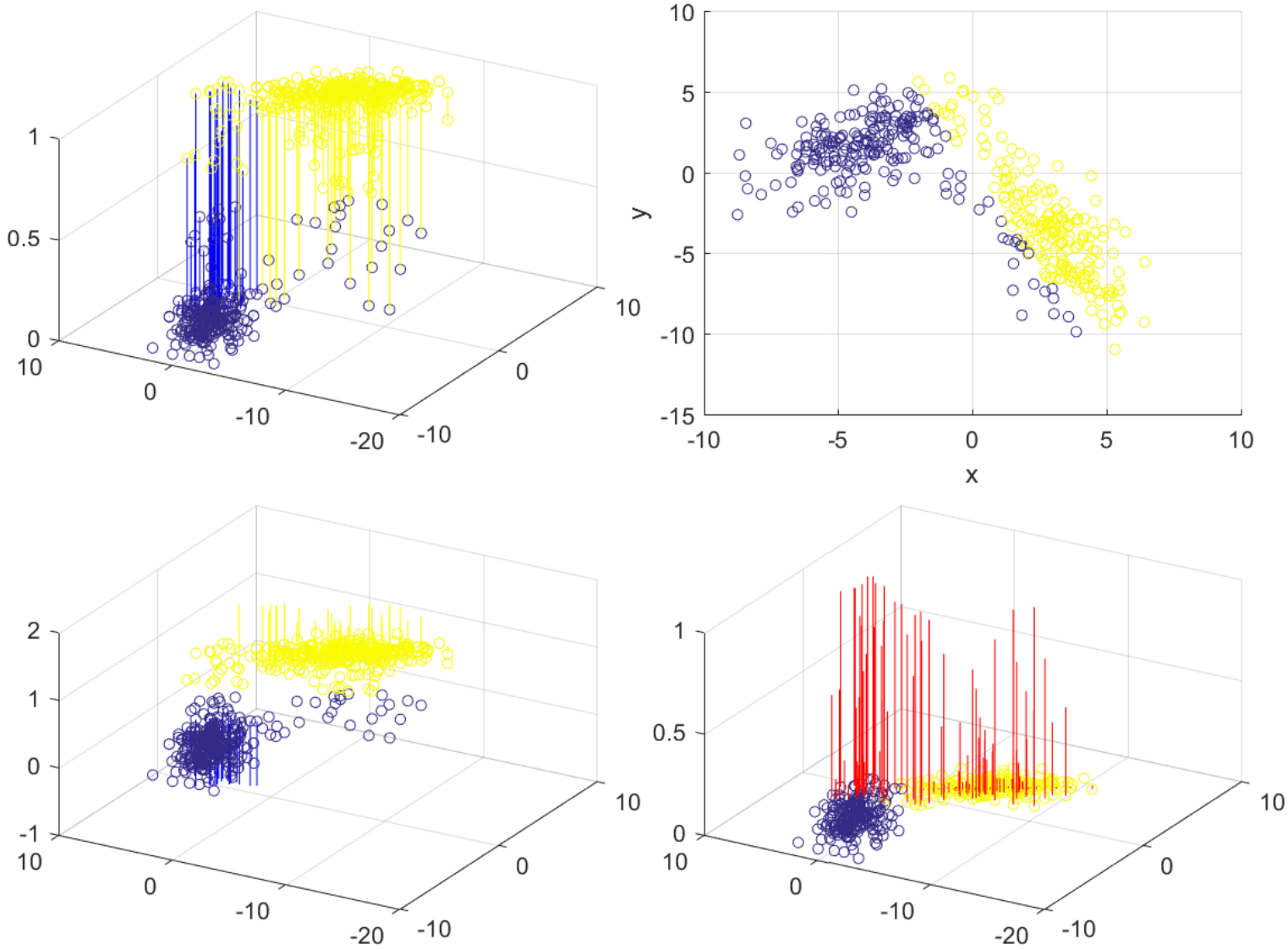
Epoch 14, SSR = 147.53



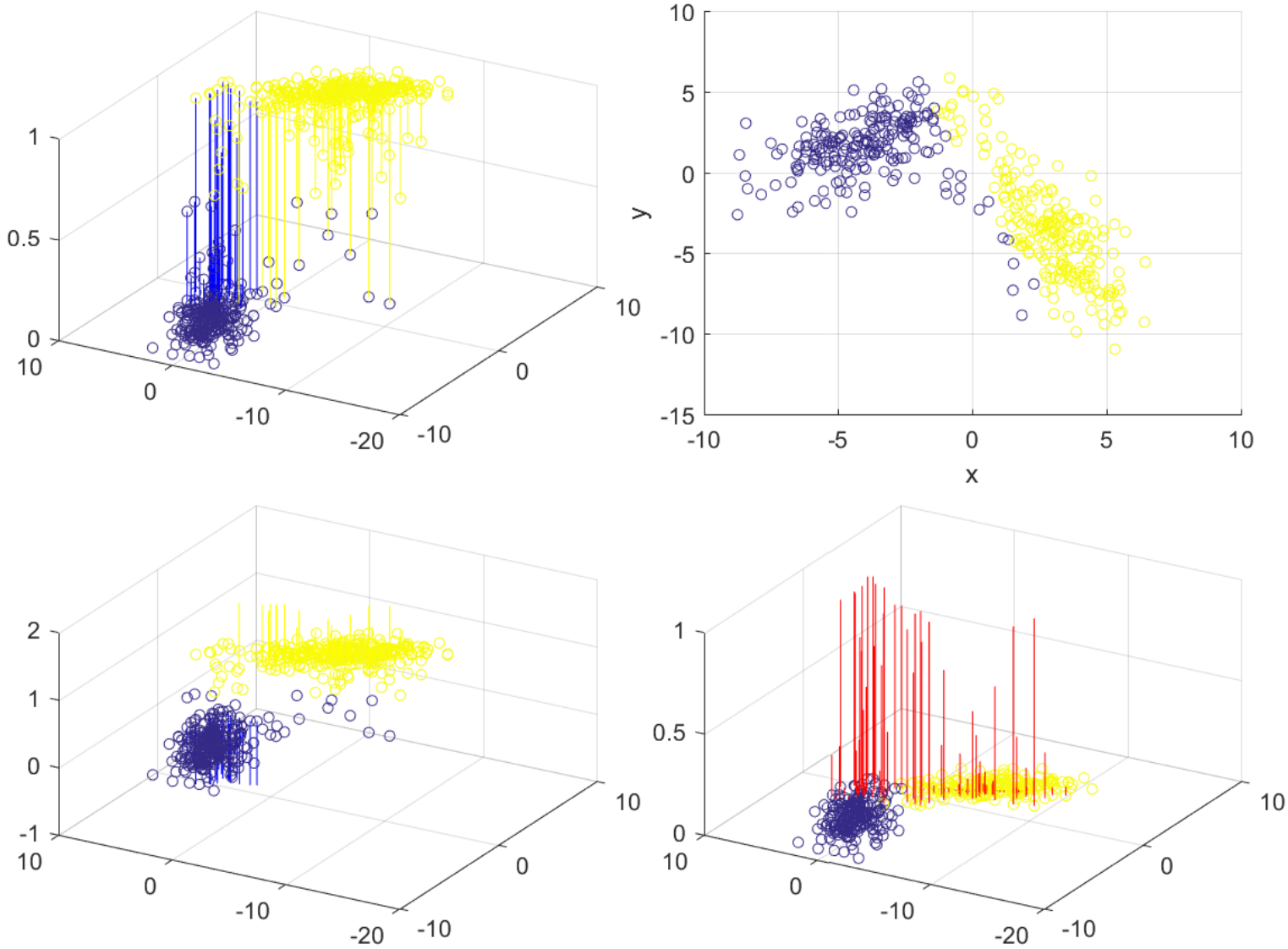
Epoch 16, SSR = 75.57



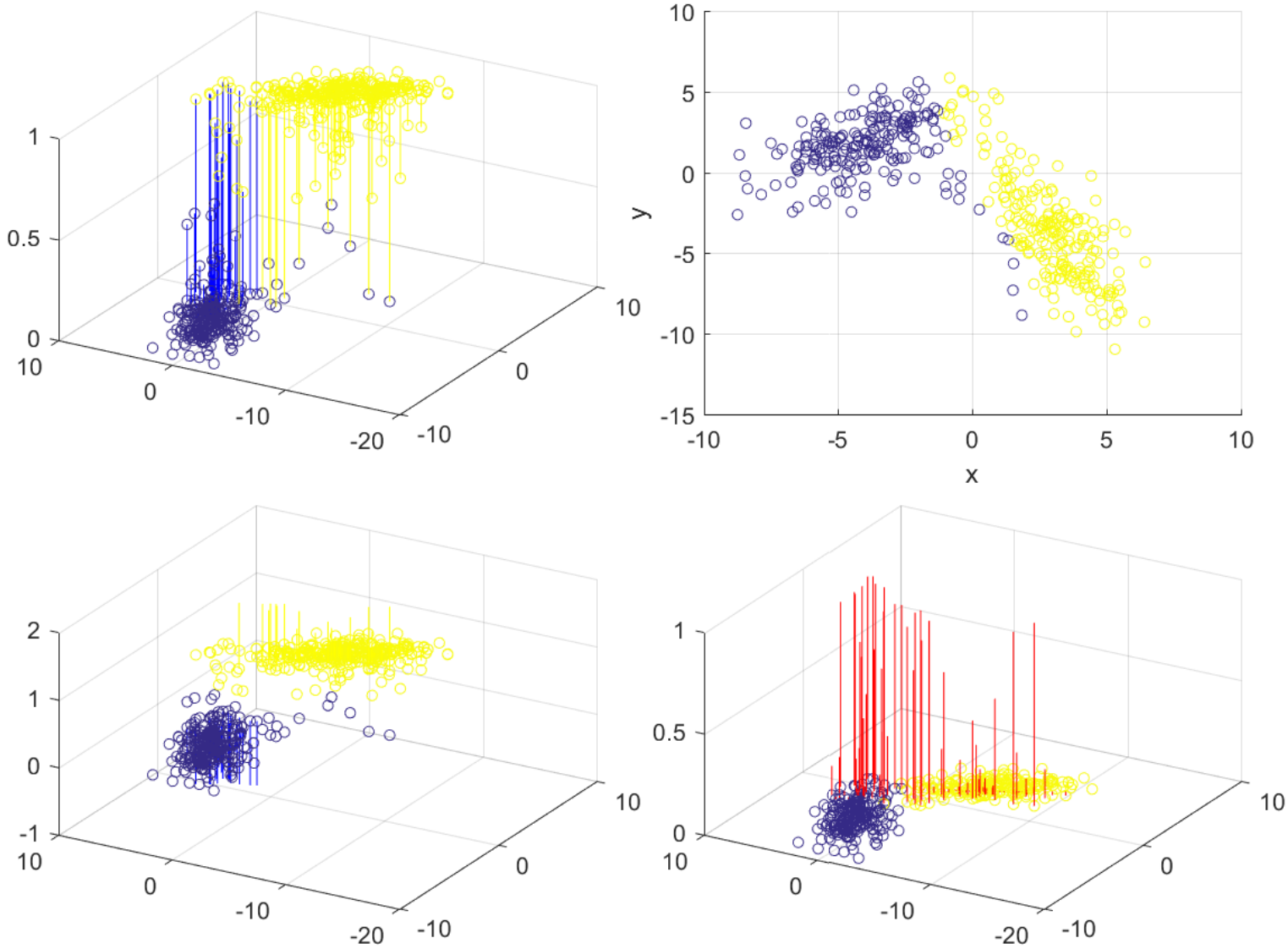
Epoch 18, SSR = 37.85



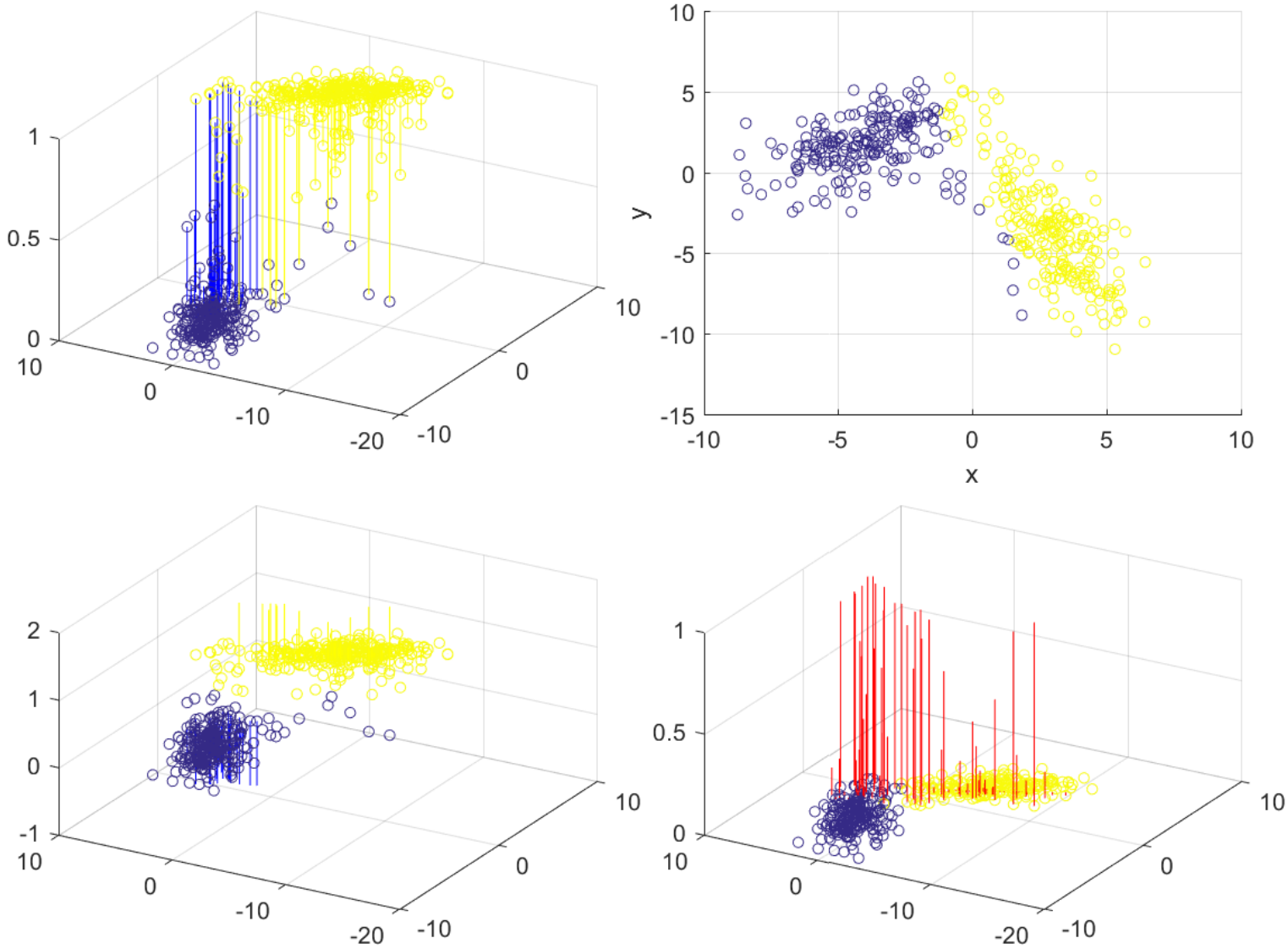
Epoch 20, SSR $= 27.86$



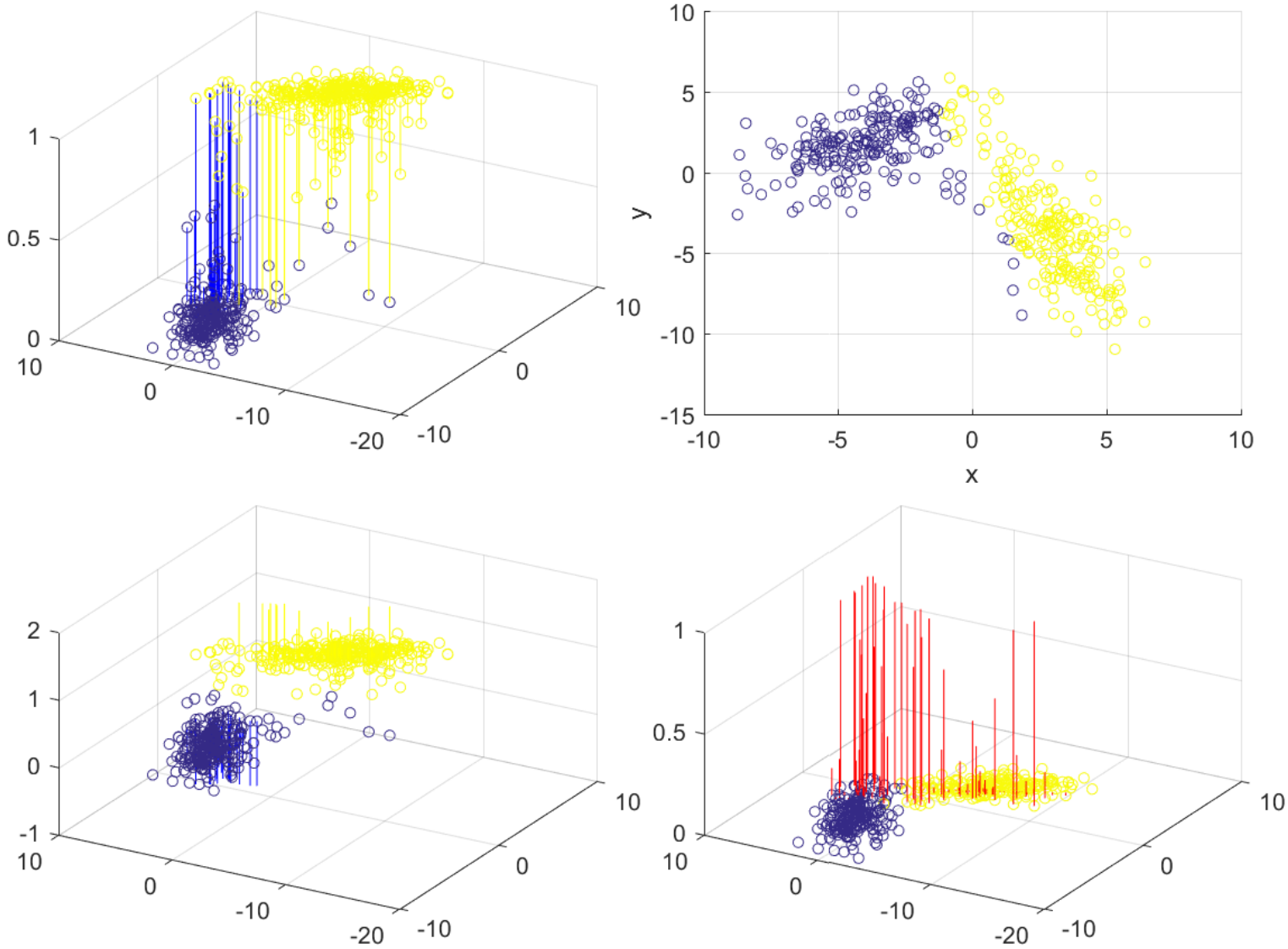
Epoch 22, SSR = 26.39



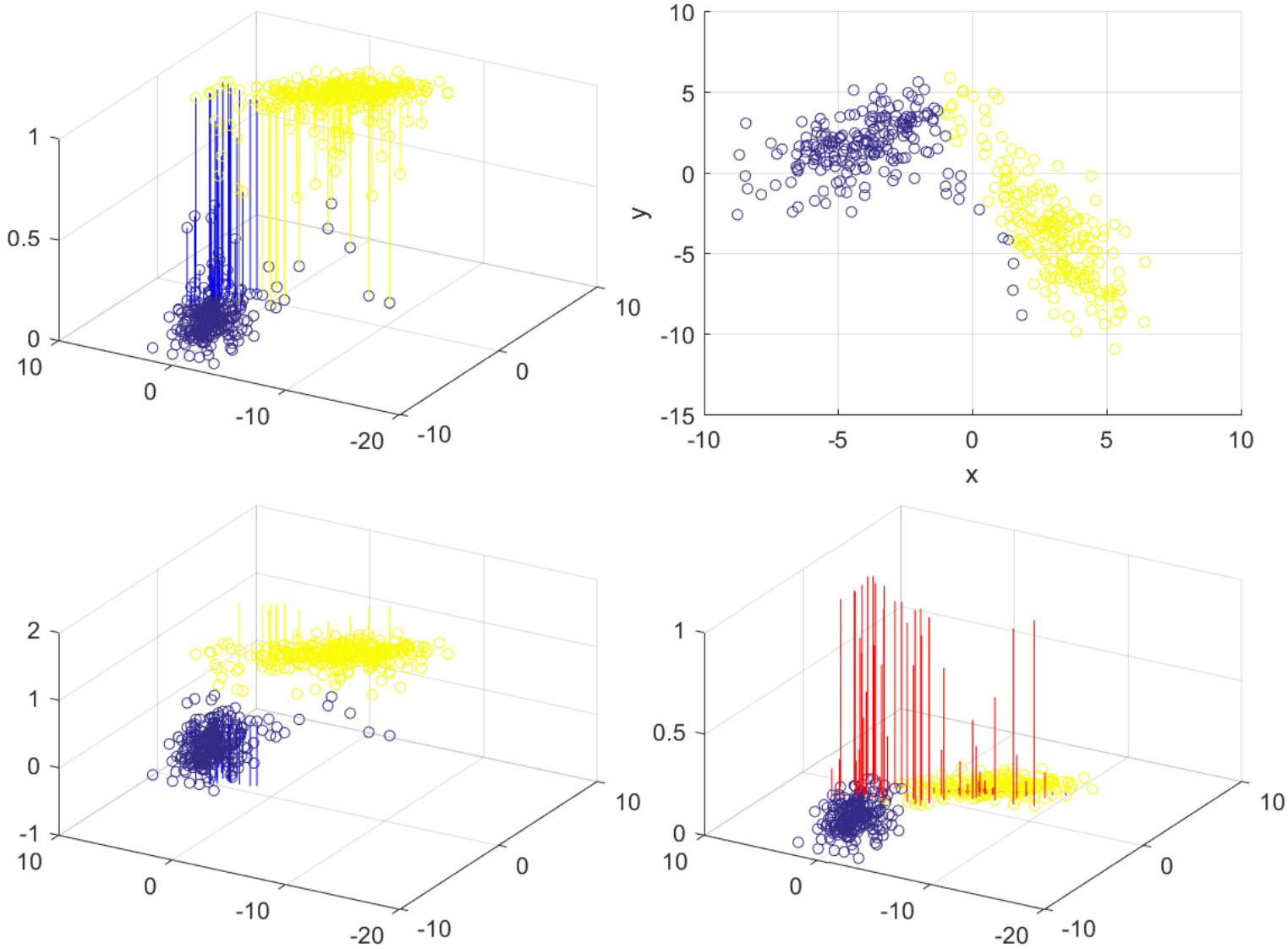
Epoch 24, SSR = 26.25



Epoch 26, Training should stop here!



Epoch 28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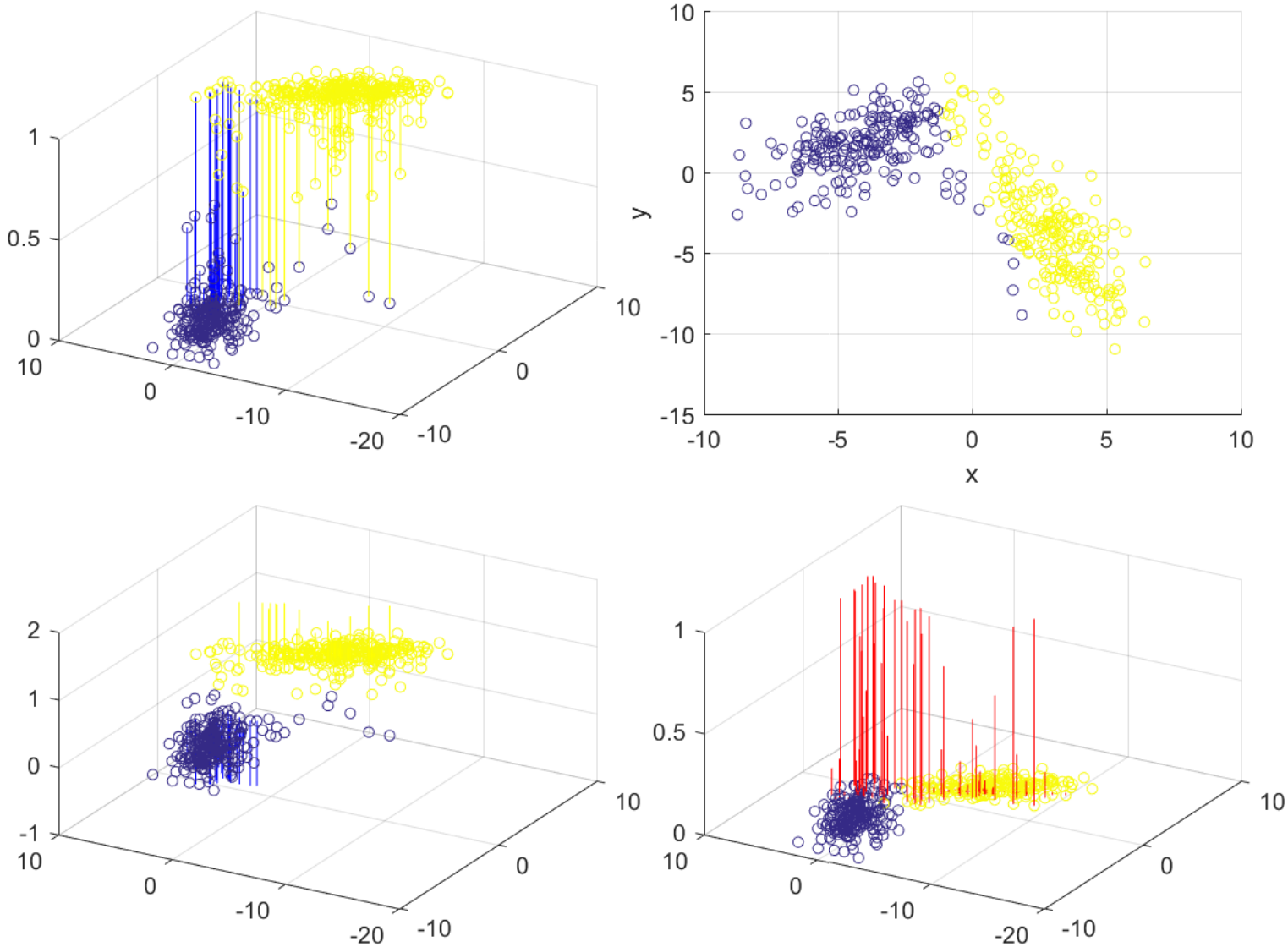
Epoch 30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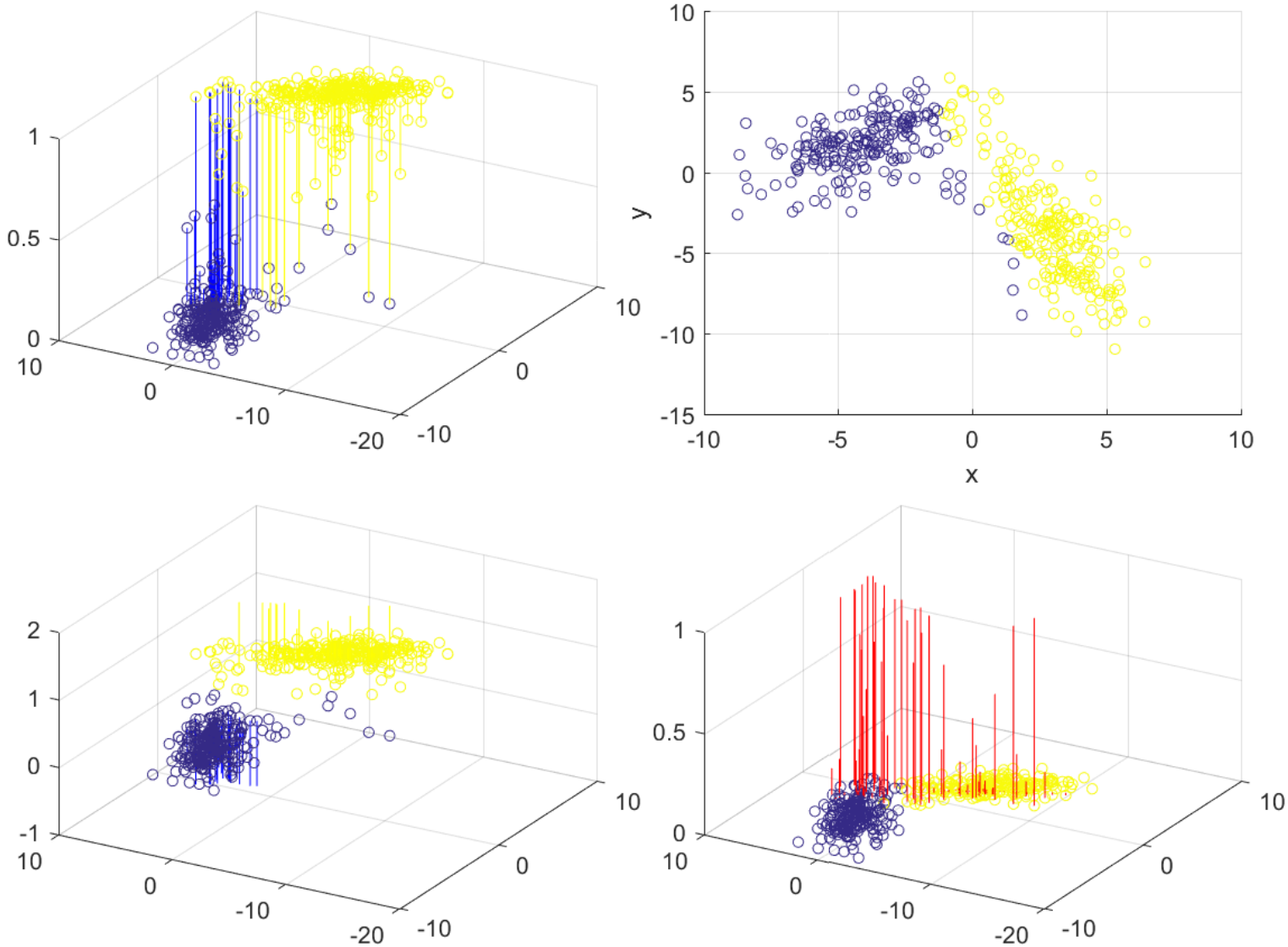
Epoch 32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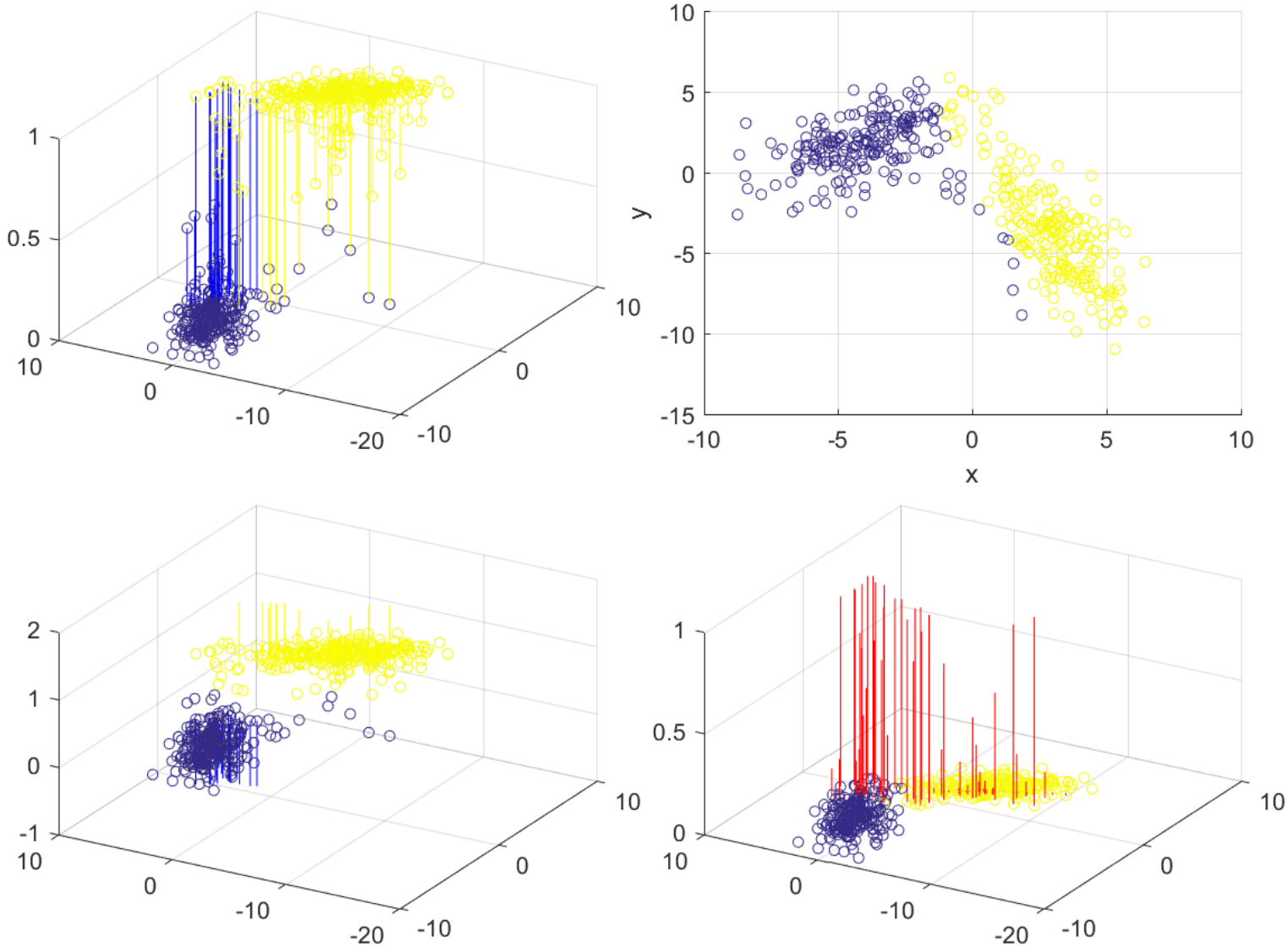
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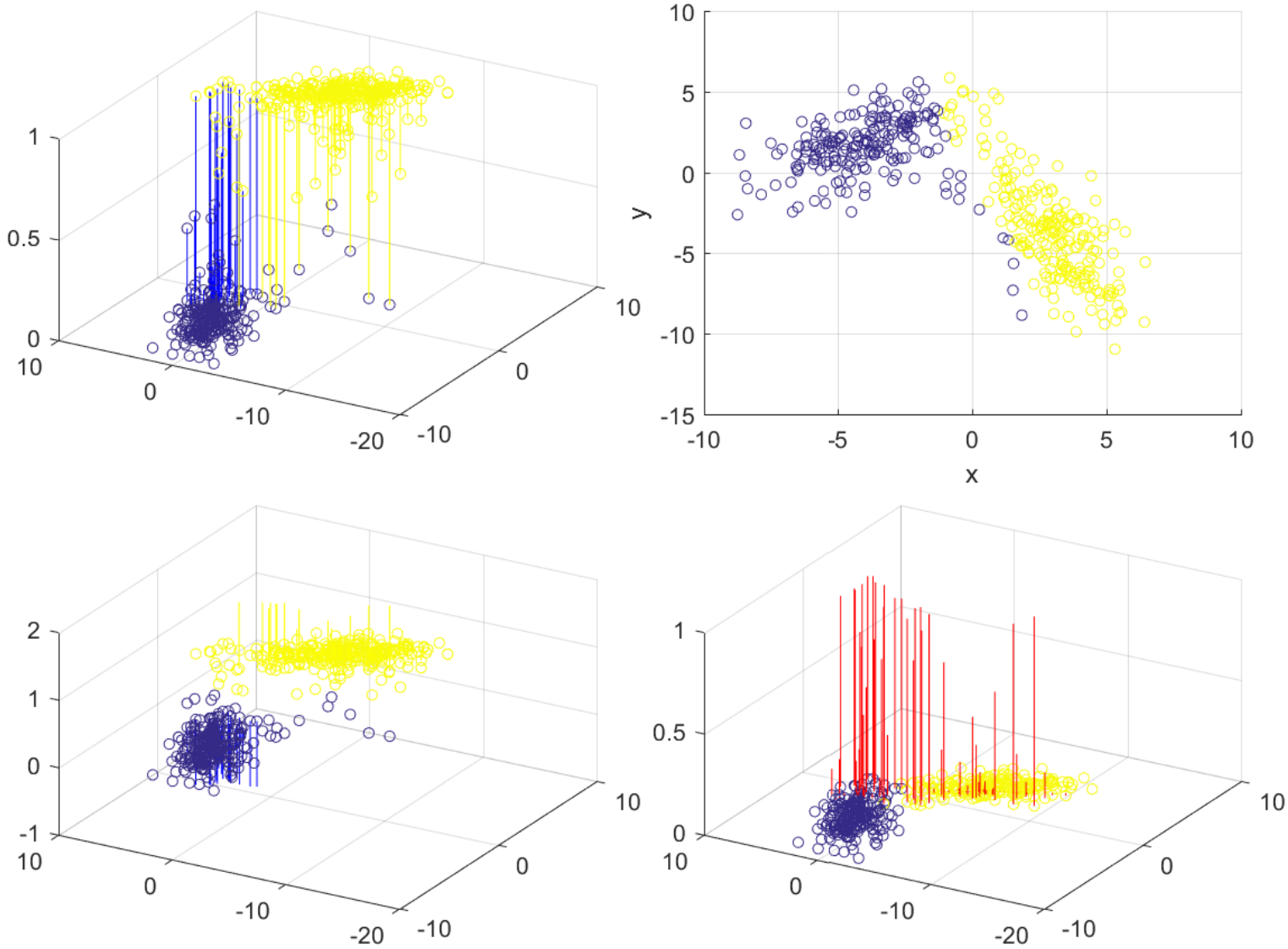
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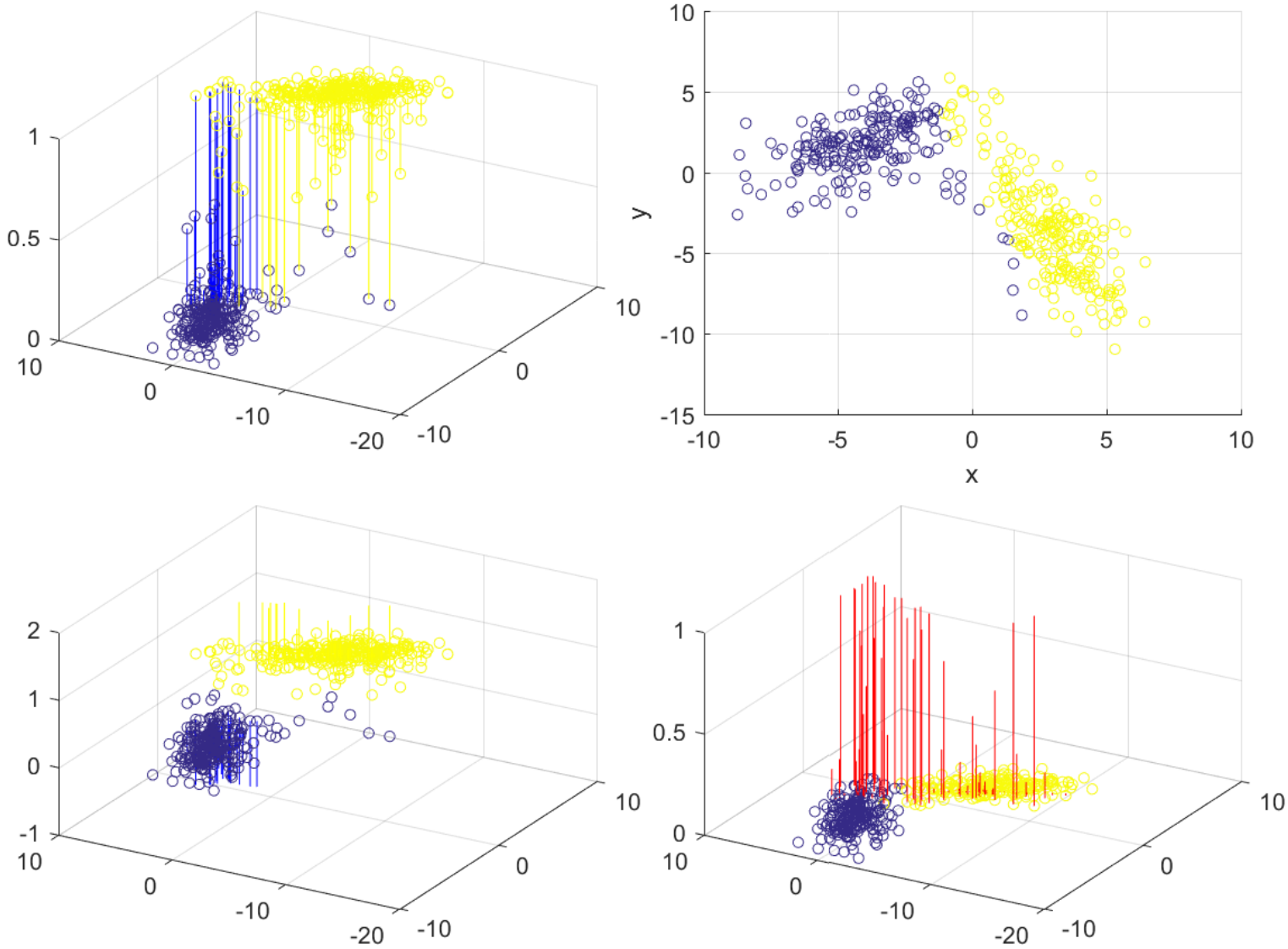
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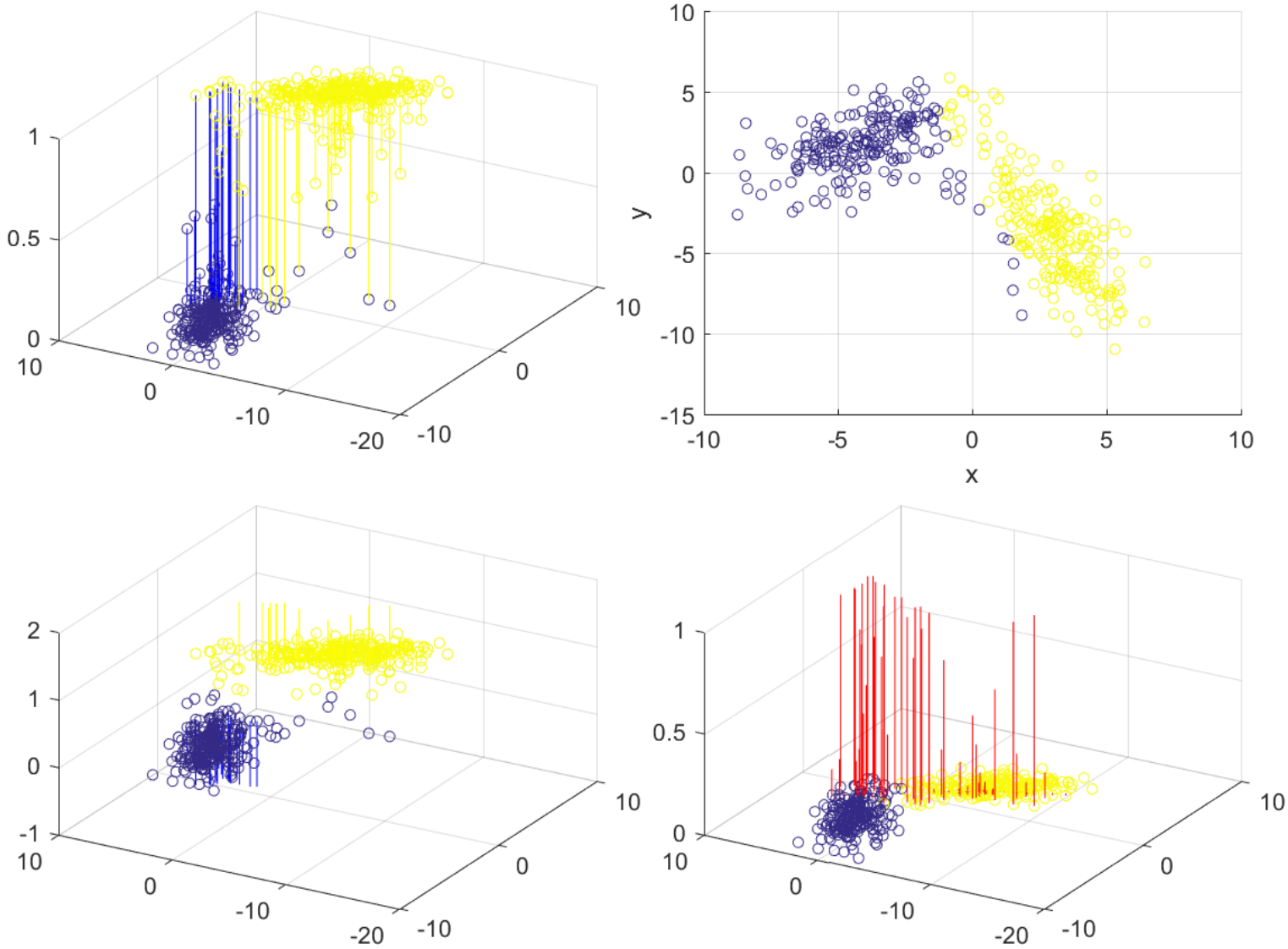
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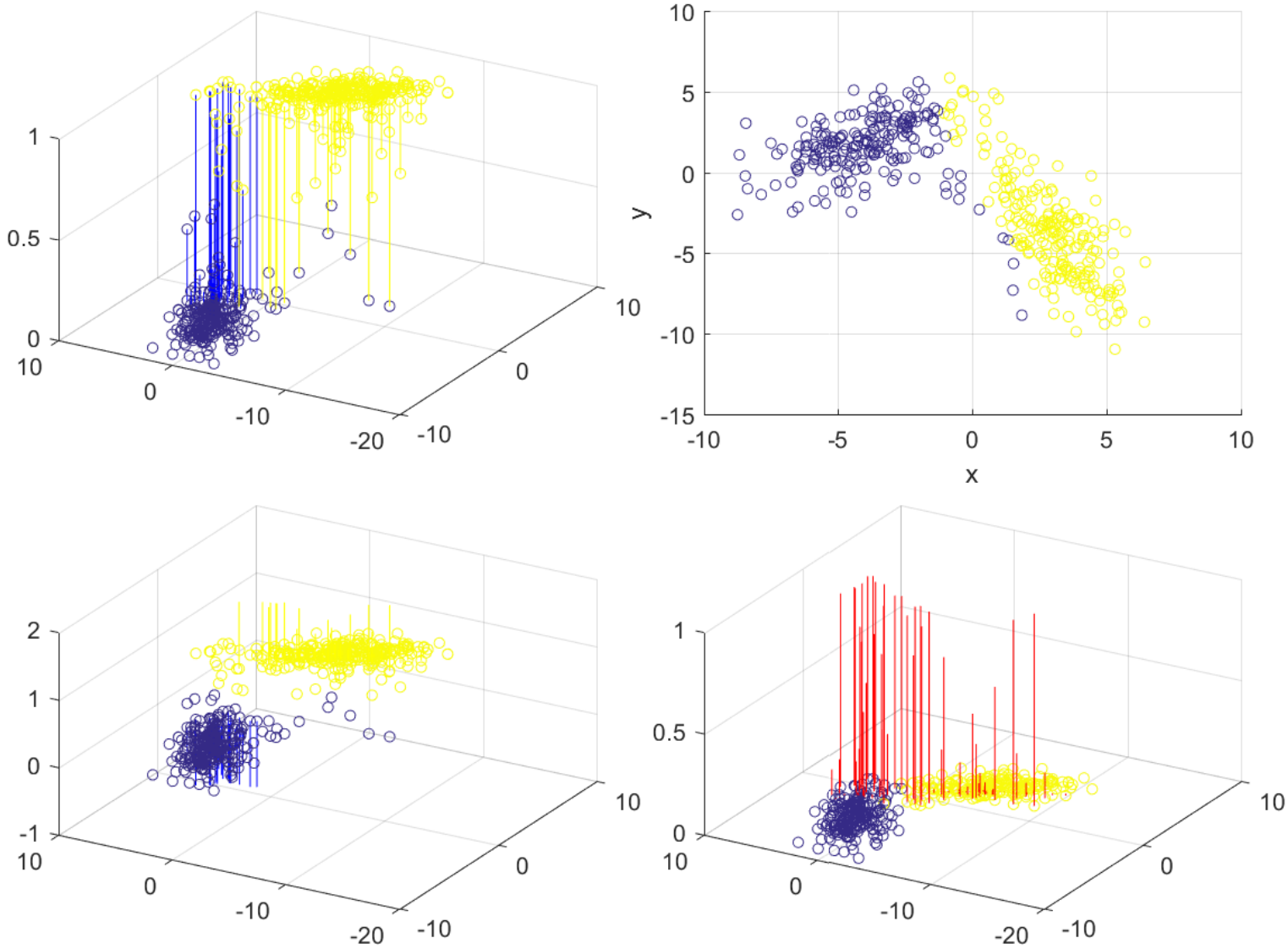
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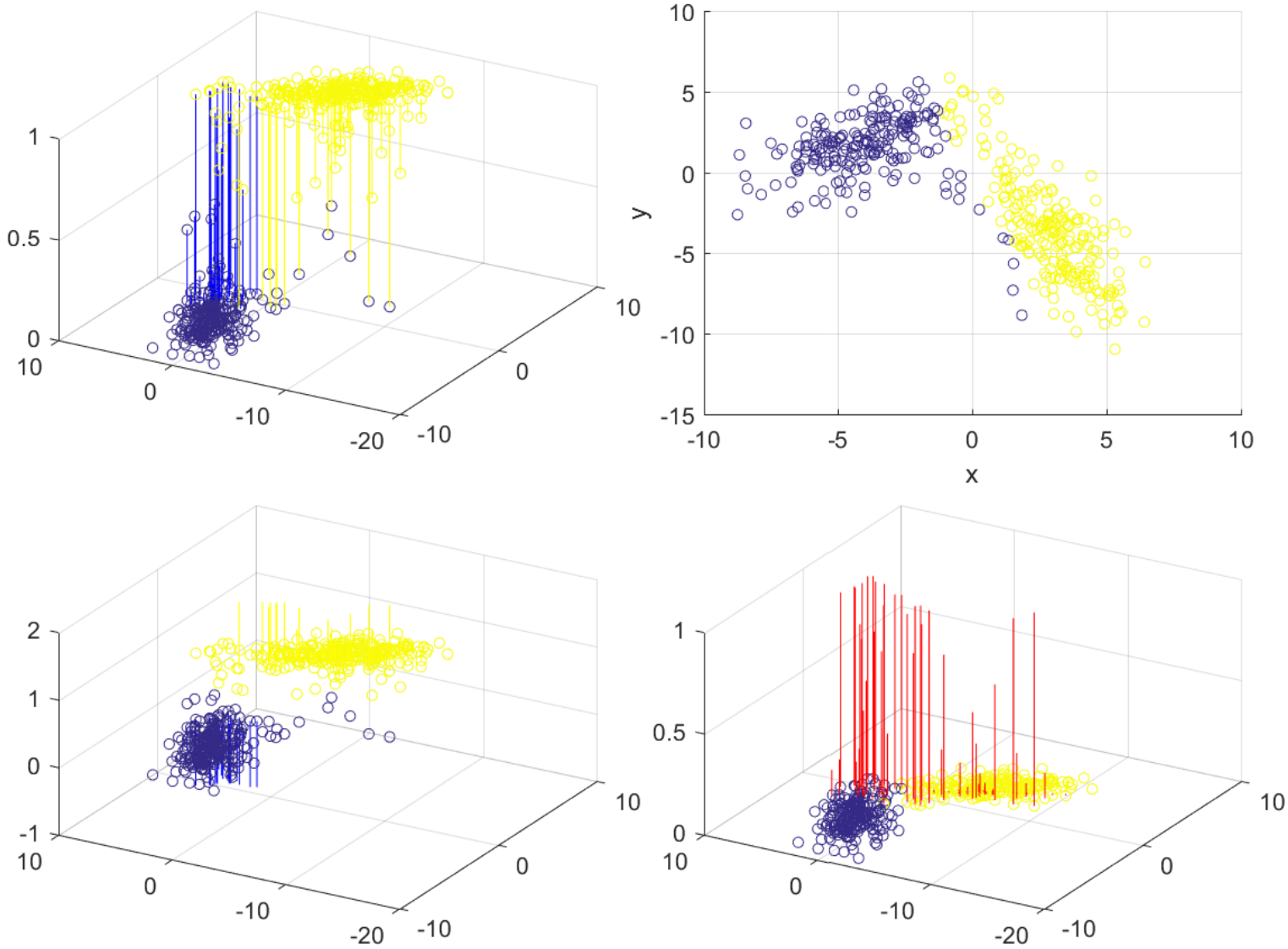
Epoch 50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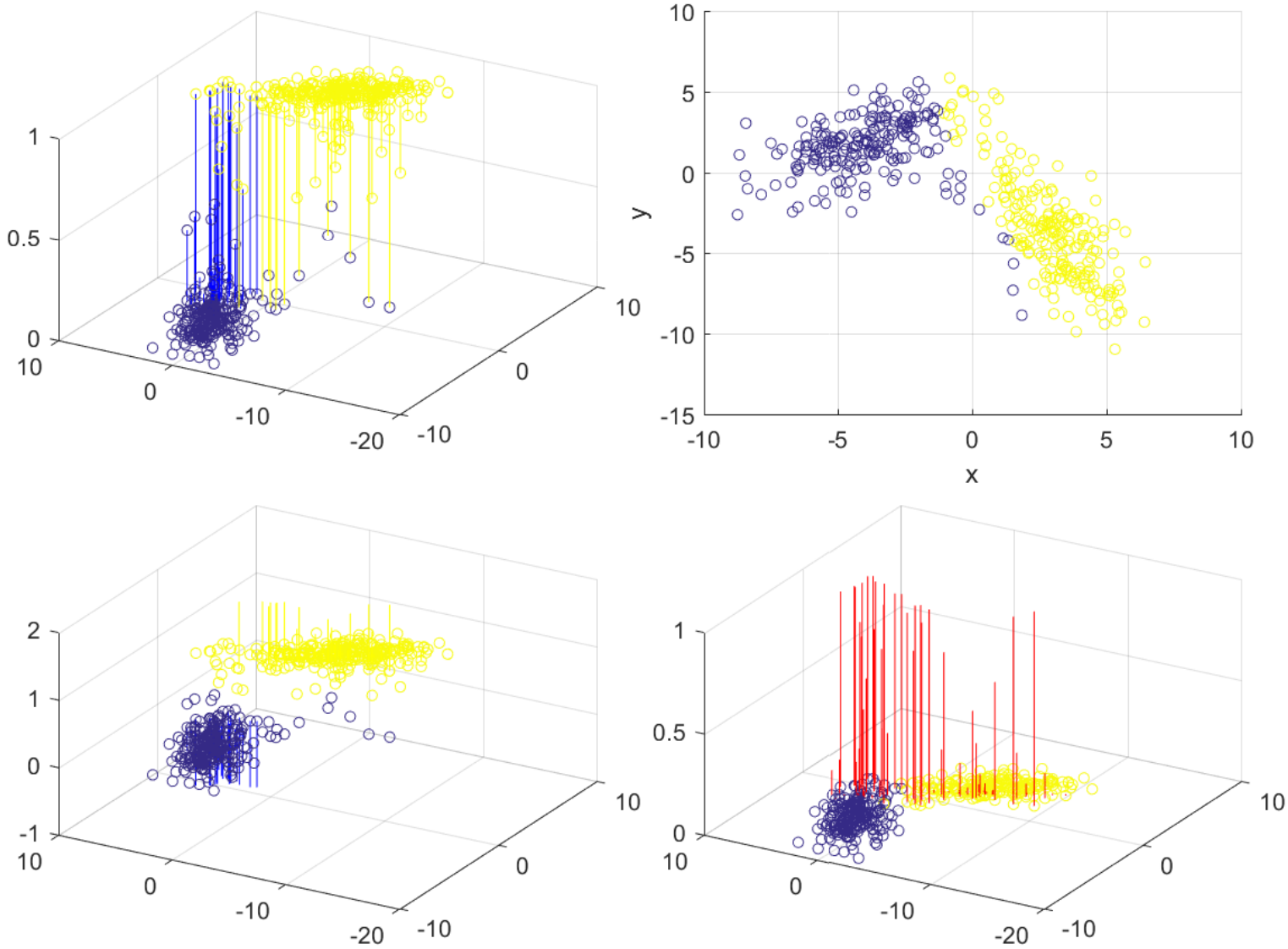
Epoch 55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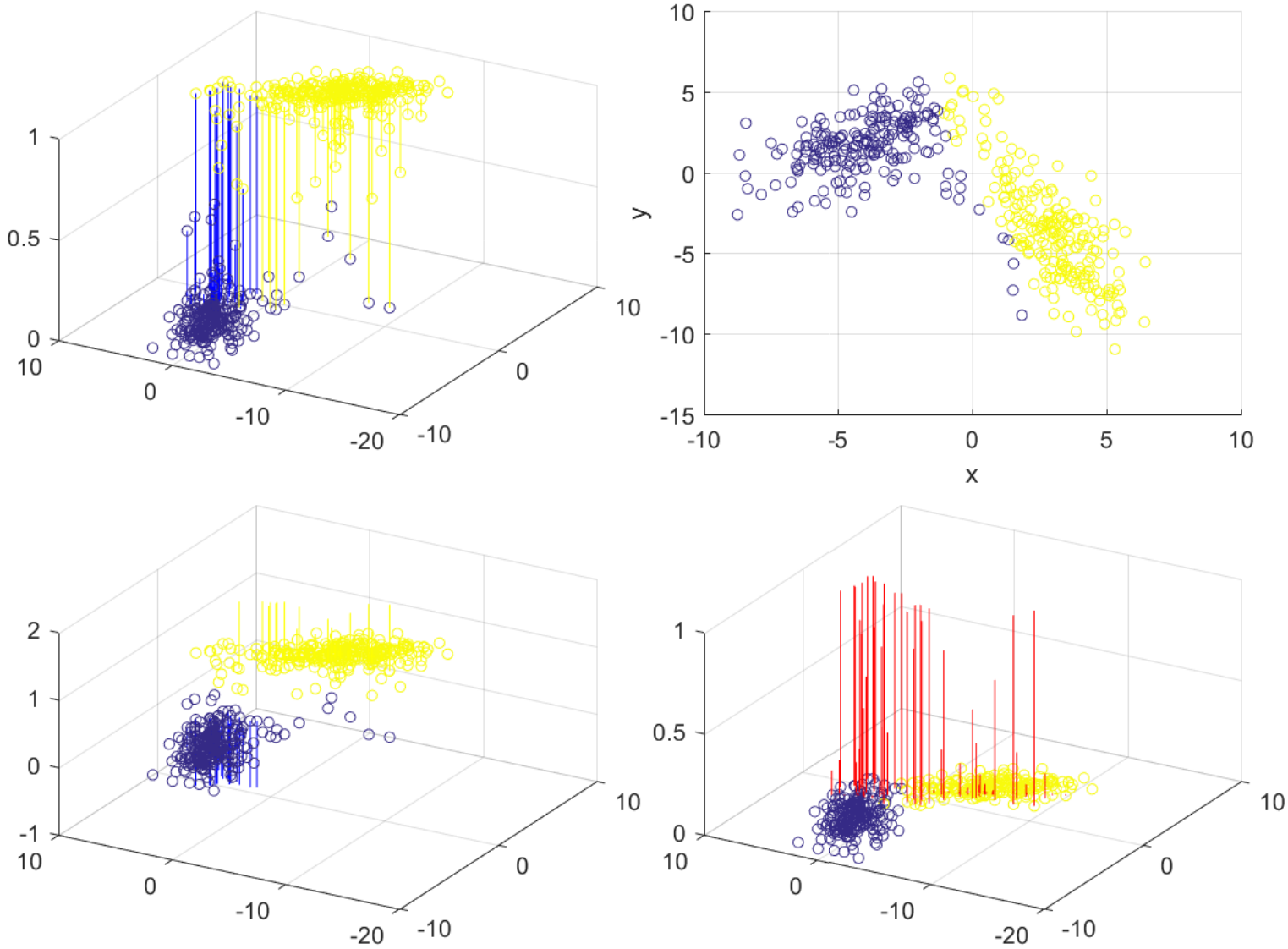
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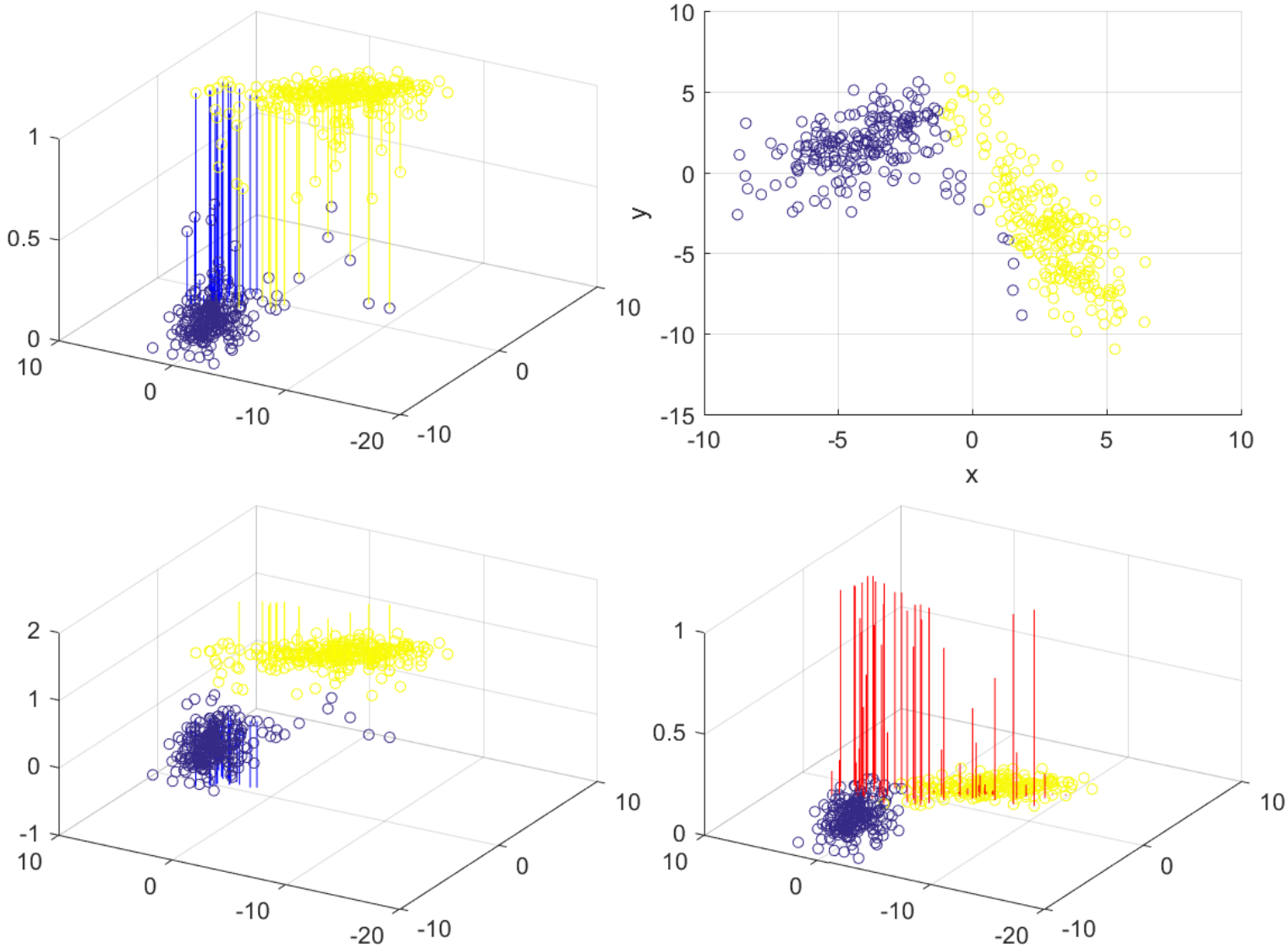
Epoch 65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