

Deep Learning 2019

Examination May 7th, 2019

Good answer shouldn't be shorter than one page or longer than two pages.

1. Although the central ideas behind deep learning were invented decades ago, the "deep learning breakthrough" happened only recently. Explain the reasons why. Other machine learning approaches had these same "reasons" — why didn't they make a breakthrough?

2. Below is some mystic formula. Explain 1) what happens in the formula and 2) why is it relevant to deep learning.

$$v = \alpha v - \eta g \quad \theta = \theta + v$$

3. Explain 1) what is maximum likelihood estimate (MLE), 2) what is cross-entropy, 3) how they are related and 4) why this is relevant to deep learning.

4. See the attached image. Explain what it illustrates and why it is important. For extra points, you can try explaining the basics of some labels.

