

Using Active Learning for Assisted Short Answer Grading

- ▶ Short answer for assessing the knowledge.
- ▶ Fast and easy method for assisting short answer grading using active learning.
- ▶ Human in the loop.

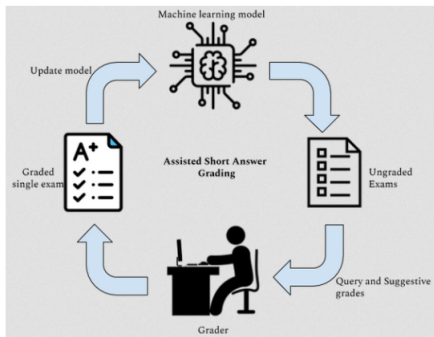
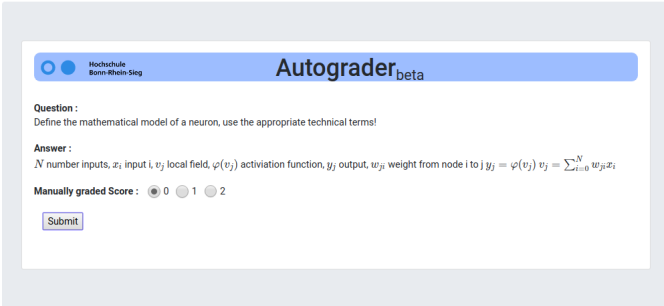


Figure 1: Workflow of active learning in assisted short answer grading [1]

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The screenshot shows a web interface for 'Autograder_beta' at Hochschule Bonn-Rhein-Sieg. It contains a question about a neuron model, an answer field with a mathematical formula, and a 'Manually graded Score' section with radio buttons for 0, 1, and 2. A 'Submit' button is also visible.

Hochschule
Bonn-Rhein-Sieg

Autograder_{beta}

Question :
Define the mathematical model of a neuron, use the appropriate technical terms!

Answer :
 N number inputs, x_i input i , v_j local field, $\varphi(v_j)$ activation function, y_j output, w_{ji} weight from node i to j $y_j = \varphi(v_j)$ $v_j = \sum_{i=0}^N w_{ji}x_i$

Manually graded Score : 0 1 2

Figure 2: Querying stage of active learning in GUI

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1. Features used : Features from Sultan et al., 2016 (Length ratio, word alignment score, semantic vector similarity)
2. Learning method : Random forests.
3. Active learning sampling strategy : Least confident based uncertainty sampling.
4. Frameworks: Flask, Vue-js.

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Datasets	Clicks with active learning	Clicks without active learning
Neural network	338	680
SemEval 2013	3527	5104
Mohler'11	1386	2352

Table 1: Number of clicks required to grade the answers with and without active learning.

- ▶ Saves time.
- ▶ Less effort.
- ▶ Reaches the performance of supervised learning with less amount of graded answers for training.

Thank you!