Assignment 2.2

The layers are composed of 64 neurons. There are 10 time steps

The three ReLU layers are added with:

*model.add(Dense(64, activation='relu'))*

*model.add(Dense(64, activation='relu'))*

*model.add(Dense(64, activation='relu'))*

And the three linear layers are added with

*model.add(Dense(64, activation='linear'))*

*model.add(Dense(64, activation='linear'))*

*model.add(Dense(64, activation='linear'))*

|  |  |  |
| --- | --- | --- |
|  | Loss | Accuracy |
| Without layers | 0.3108 | 0.9142 |
| 3 hidden layers with linear activation | 0.2813 | 0.9172 |
| With 3 hidden layers with ReLU activation | 0.1219 | 0.9635 |

3 layers with ReLU activation performs the best, because it has the highest accuracy and the lowest loss after 10 time steps. The one without hidden layers performs the worst, because it has the lowest accuracy and a much higher loss.

(ReLU was wel de beste, ik had alleen de verkeerde namen in de tabel gezet sorry!)

Assignment 1.2

*How does the introduction of whole-slide imaging change the typical workflow of a pathology lab*

Algorithms test if there are metastases. The same test is performed in the pathology lab. There are flexible 2-hour sessions to ascertain the likelihood of nodal metastases. The algorithms sometimes outperforms the pathologists. [1]

What changed in the pathology labs is that is has started to move towards a fully digital workflow. This is made possible by scanners for whole slide imaging. This digital workflow has many benefits: more storage available and more browsing capacities. The most important advantage is that it can help pathologists in their work. [2] The digital pathology also improves the clinical workflows, for example there is a lower risk of physical slides getting broken or lost. [3]

The progress of implementing whole slide imaging into a routine is more than just deploying hardware. It is important to look at the workflow and management issues. Futhermore, addressing the concerns of pathologists who are going to use the WSI systems is really important. Pathologists might not be comfortable with the WSI systems. [4]

[1] Bejnordi, B. E., Veta, M., Van Diest, P. J., Van Ginneken, B., Karssemeijer, N., Litjens, G., van der Laak, J. A. W. M. ,the CAMELYON16 Consortium, 2017. Diagnostic assessment of deep learning algorithms for detection of lymph node metastases in women with breast cancer. JAMA, 318.

[2] Veta, M., et al., 2015. Assessment of algorithms for mitosis detection in breast cancer histopathology images. Medical image analysis, 20.

[3] Madabhushi, A. and Lee, G., 2016. Image analysis and machine learning in digital pathology: Challenges and opportunities. Medical Image Analysis, 33.

[4] Evans, A. J., Salama, M. E., Henricks, W. H., & Pantanowitz, L. (2017). Implementation of Whole Slide Imaging for Clinical Purposes Issues to Consider From the Perspective of Early Adopters WSI Implementation for Clinical Use-Evans et al. *Canada Arch Pathol Lab Med*, *141*, 11–223. https://doi.org/10.5858/arpa.2016-0074-OA