

Popular science summary

Blood cell autovalidation- will machines replace humans in the future?

We're about to enter an exciting time where autovalidation will change the game of industries, become a part of the technologies we use in our everyday life and affect the whole society. Artificial Intelligence (AI) have already changed the map of where tech can replace human minds and no one knows the limits of what the future holds. One area where AI has begun to conquer land is the difficult, time consuming and vital analysis of blood samples done at hospitals. Will AI machines be able to do the job of humans in blood analyzes in the future?

The implementation of autovalidation means that processes which are normally analyzed and controlled by humans can instead be validated by a machine. This can lead to major savings in time and costs, especially in pressured areas like the healthcare sector, while providing unbiased results based on statistics and experience.

CellaVision is a company which have taken blood analysis towards a digital transformation. They now want to answer the question if it is possible to autovalidate the digital blood cell analysis using AI-methods. Applying autovalidation to the systems of CellaVision would mean that some analyzes can be completely done by computers, resulting in

improved efficiency and savings in time and cost at hospitals and laboratories around the world. If created and implemented correctly, this type of technology could save lives.

Several different types of AI-methods were tested for autovalidation of blood cells. The task for the model was to separate easy cells from difficult ones, which is the first step in autovalidation. We found that the most successful method was a module detecting abnormal patterns among cells. It could be used for successfully autovalidating 74% of the cells. It is also probable that the result could have been even better if a better technique had been used to label the cell images which the module was trained on.

In the end of the study, an algorithm arranging cells with similar appearance in clusters was used for visualizing the results. It would definitely be interesting to look further into this technique in the future to see if it could be used for autovalidation itself. You could already see patterns of how the difficult cells were located among the normal cells, which makes this approach very promising.

All in all, the results indicates a promising future. Who knows, maybe one day the machines will have replaced the humans when it comes to blood analysis?