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| **Titel der Maturaarbeit** | RtoV – Deep Learning with Generated Data for Raster Vectorization |
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| **Klasse** | 6e |
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| **Zusammenfassung der Arbeit mit den Kernaussagen** |
| The conversion from raster images to vector representations remains a challenging task to this day and is actively researched. Due to the inherent difficulties that algorithmic approaches face, such as finding shapes in noisy or blurred images under varying lighting conditions, more research is being done using machine learning, where the most apparent problem is the acquisition of appropriate training data. Therefore, automatically generating pairs of raster images and their corresponding vector representations can be advantageous. This paper explores this particular approach: Training a machine learning model on generated data pairs. A demonstration is conducted in a limited scope, where a deep learning model is trained on on-the-fly generated data in order to perform the conversion from raster images containing clearly visible shapes into vector representations. The model used in the demonstration is a simple multi-task learning model with a Convolutional Neural Network as a front end and various branches responsible for classifying the shape or determining the features of a particular shape.The model, although trained on a limited number of images, was able to determine the shape with high accuracy and learned to approximate the data relevant for specifying the shapes Line, Rectangle and Circle. The vertices of the shape Triangle have proven to be more challenging to estimate and the model presented in the demonstration was not able to provide an accurate representation for this shape. |

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| **Visualisierung** |
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