ADAI course portfolio

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Individual repository:

<https://github.com/Razvan-Marian-Budurovici/ADAI-individual-repository-2025>

Group repository:

<https://github.com/FontysVenlo/grouprepository-group-2>

Learning goal I

Proficiency level: Beginning

I consider myself a beginner in machine learning and neural networks, with limited theoretical knowledge and practical experience. My initial experience involved developing a basic image labeling AI model, which introduced me to concepts of artificial neural networks (ANNs) and convolutional neural networks (CNNs) in a practical context.

Through that previous project, I applied key steps of the Data Science Methodology, including defining the problem (automatic image labeling), preprocessing data (resizing and normalizing images), selecting and training a CNN model, and evaluating its performance using accuracy and loss metrics. This hands-on experience helped me understand how neural networks work, their applications in real-world tasks such as image classification, and their limitations, including data requirements, overfitting, and computational costs.

Additionally, as part of a group research activity, I explored the theoretical foundations of neural networks, deep learning, and CNNs, analyzing their applications and limitations across various domains. My findings and answers to research questions can be found in this document:

Overall, I have made progress in evaluating machine learning and neural network concepts from both practical and theoretical perspectives. Moving forward, I aim to deepen my understanding of advanced CNN architectures, hyperparameter tuning, and real-world applications of deep learning.

Learning goal II

Proficiency level: Undefined

Apply and evaluate annotation strategies, with and without machine learning  
techniques, emphasising the importance of accurate data labelling for  
training models, using annotation tools and guidelines, leading to better data  
quality and consistency, avoiding bias.

Learning goal III

Proficiency level: Undefined

Evaluate Large Language Model concepts, focusing on their working, their  
applications and limitations, and their application in real-world cases based  
on the Data Science Methodology, taking ethical considerations into  
account.

Learning goal IV

Proficiency level: Orienting

Evaluate transfer learning principles and their importance for improving  
model performance with limited data, working on projects that use pre-  
trained models and datasets, leading to practical methods and positive  
feedback on their work.

Learning goal V

Proficiency level: Orienting

Show adequate professional skills (future-oriented organisation,  
investigative ability, personal leadership and targeted interaction according  
to HBO-i) in assessing your current level, personal development on learning  
outcomes and professional behaviour, and working together in a group.