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| Projectmanagementplan  **Master Thesis** |
| Programme: Artificial Intelligence in Medicine  Author: Vinzenz Uhr  Expert: Dr. Richard McKinley  Date: 29.02.2024 |

**Change log**

| Version | Date | Change | Author |
| --- | --- | --- | --- |
| 0.1 | 01.03.2024 | Draft | Vinzenz Uhr |
| 0.2 | 06.03.2024 | Add chapter projectrisks | Vinzenz Uhr |
| 1.0 | 30.08.2024 | Remove project outcome “Extensions to new Datasets”, add final projectplan | Vinzenz Uhr |

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# Projectplan



Figure 1: Projectplan V0.2

# Organisation



Figure 2: Projectorganisation

# Reporting

| Topic | Frequency | Responsible | Recipient | Termin |
| --- | --- | --- | --- | --- |
| Status update | *Every two weeks* | *Projectmanager* | Client | 11.03.24 |
| Administration meeting SCAN | *Every week* | *Wiest, Roland* | SCAN Members | Monday 08:30 |
| Defence | *One-time* | *Projectmanager* | Client | tbd |

Table 1: Reporting

# Project outcome

The thesis proposal is in Appendix A. In contrast to the original proposal the “Replication of Blob Loss paper” and the “Implementation of the sliding window metrics” mentioned in “Nature of the Thesis” will not be part of this project.

Figure 3: Project outcome

# Projectrisks

Probability of occurrence: unlikely, possible, probable, very probable

Extent of damage: small, medium, large, catastrophic

| Nr | Title | Description | Probability of occurrence | Extent of damage | Prevention | Handling on occurrence |
| --- | --- | --- | --- | --- | --- | --- |
| 1 | **Long training durations** | Noise diffusion models needs a lot of training data and is slow in inference because it needs multiple steps. Training can therefore take a lot of time (multiple days to weeks). This leads to project delays. | Probable | Medium | - better infrastructure? | - Training and working on multiple models  - Stop before convergence  - POC with small scale training to prevent mistakes |
| 2 | **Not enough training data** | Noise diffusion models needs a lot of training data to produce high quality images. It is possible that we don’t have enough data to reach sufficient quality. | possible | Medium |  | - Lession filling use case: Use inpainting challenge datasets or synthetic dataset with 100’000 samples  - Accept insufficient quality |
| 3 | **Training 3D model needs too much GPU memory/too long training duration** | 3D models have more parameters to train and the data has higher dimensionality compared to 2D. This leads to higher computation requirements. | Very probable | Medium | - start early in the project with the training  - better infrastructure? | - Try patchwise alternative  - Stop training before convergence  - Thesis scope reduction |
| 4 | **Lesion synthesis: Image quality is too bad for performance boost of downstream model** | To improve downstream model with the addition of synthetic data, the quality needs to be high [1]. If the quality is not high enough the training performance decreases. | Probable | Medium | - start early in the project with the training to evaluate the quality | - Accept insufficient quality |

Table 2: Projectrisks

[1] Shekoofeh Azizi, Simon Kornblith, Chitwan Sahari, Mohammad Norouzi, David J. Fleet. Synthetic Data from Diffusion Models Improves ImageNet Classification. 2023. arXiv: 2304.08466v1