ZWISCHENPRÄSENTATION

GREEKNET

GLIEDERUNG

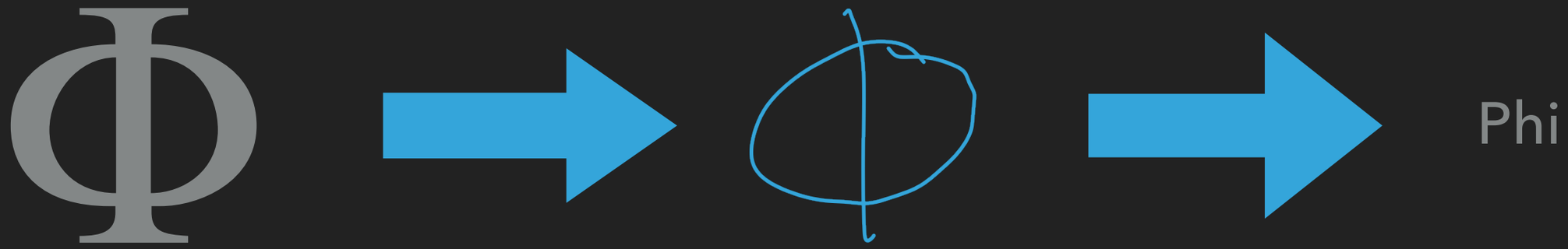
- Motivation
- Projektmanagement
- Was haben wir bis jetzt getan?
    1. Label GUI
    2. Modellstudie
    3. Inferenz GUI
- Und nun?

MOTIVATION

- Besseres Verständnis eines Textes, wenn dieser laut gelesen werden kann
- Problematik: Was war nochmal Φ ?
- Idee: Programm mit einem Canvas um unbekannte (griechische) Symbole schnell zu zeichnen

Klassifikation dieser Zeichnung

MOTIVATION

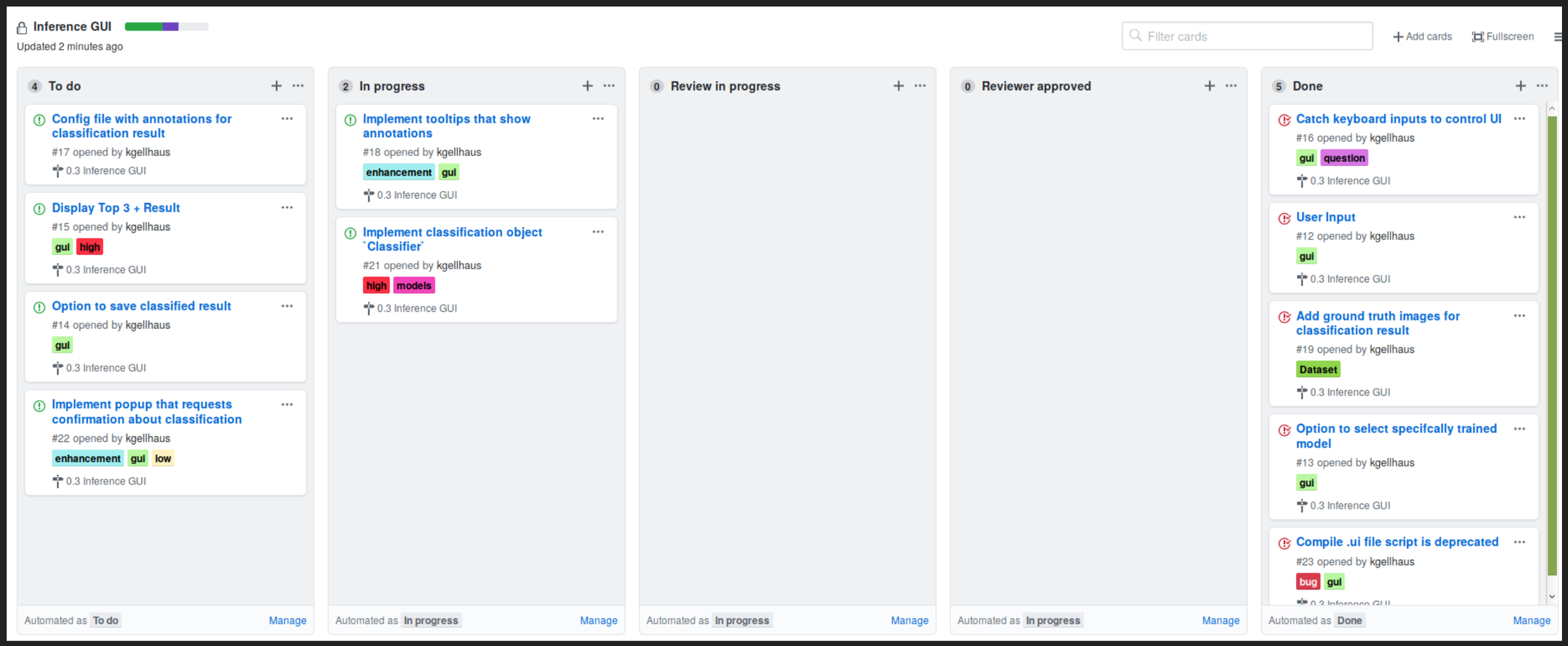


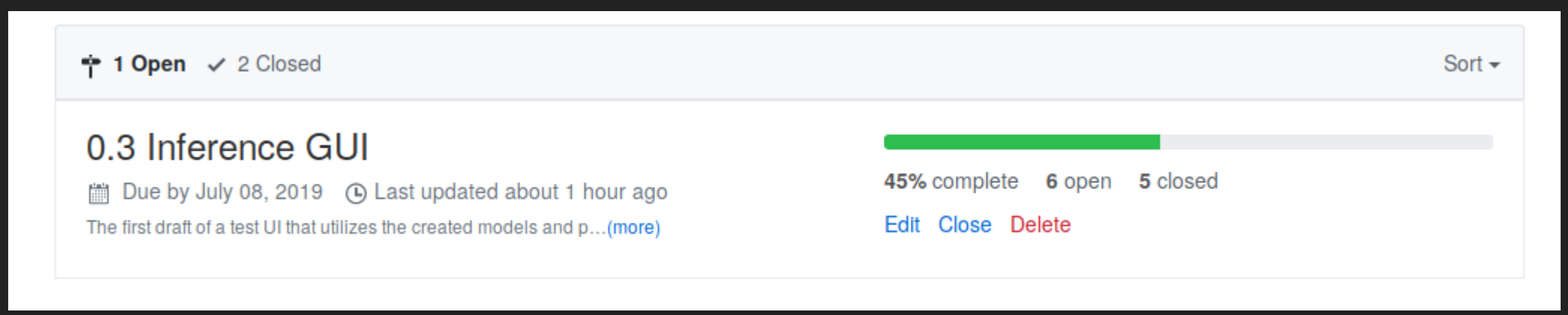
PROJEKTMANAGEMENT

- GitHub
- Trello
- CircleCI

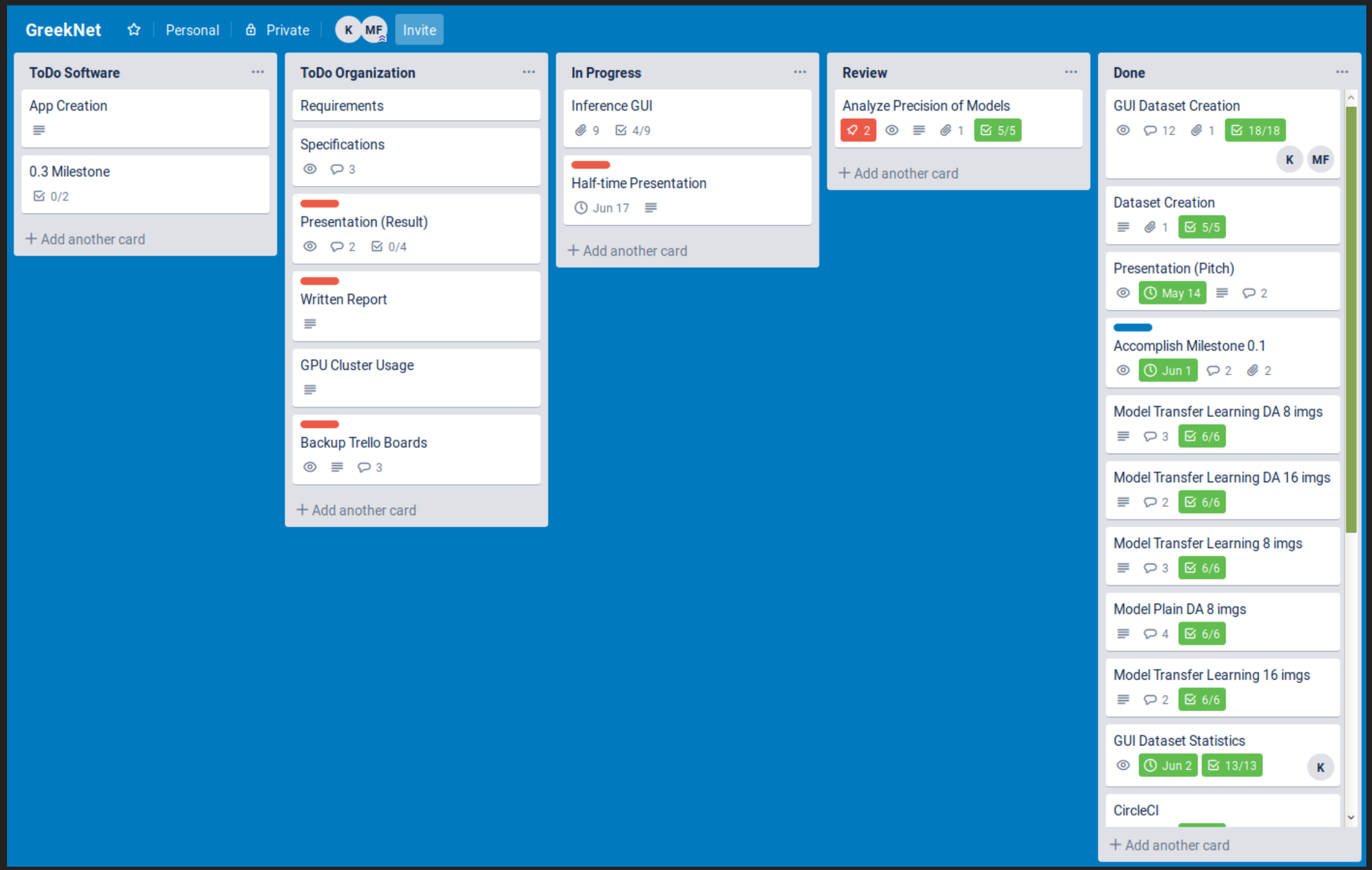
- Software:
  - Python 3
  - PyQT5
  - Tensorflow/Keras
  - Tensorboard

GITHUB

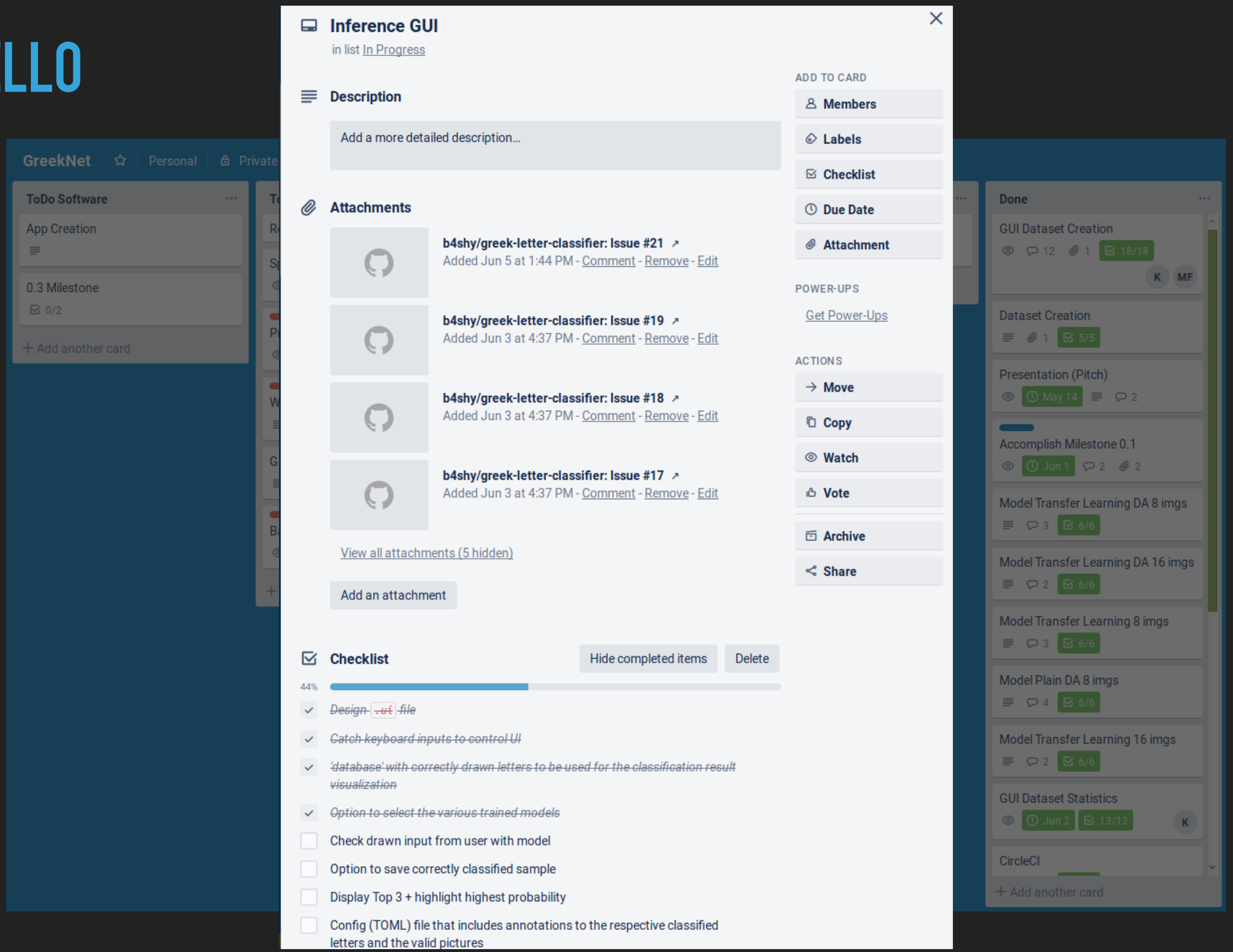

Inference GUI
Updated 2 minutes ago
Filter cards
Add cards
Fullscreen
4 To do
Config file with annotations for classification result
#17 opened by kgellhaus
0.3 Inference GUI
Display Top 3 + Result
#15 opened by kgellhaus
gui high
0.3 Inference GUI
Option to save classified result
#14 opened by kgellhaus
gui
0.3 Inference GUI
Implement popup that requests confirmation about classification
#22 opened by kgellhaus
enhancement gui low
0.3 Inference GUI
Automated as To do
Manage
2 In progress
Implement tooltips that show annotations
#18 opened by kgellhaus
enhancement gui
0.3 Inference GUI
Implement classification object `Classifier`
#21 opened by kgellhaus
high models
0.3 Inference GUI
Automated as In progress
Manage
0 Review in progress
Automated as In progress
Manage
0 Reviewer approved
Automated as In progress
Manage
5 Done
Catch keyboard inputs to control UI
#16 opened by kgellhaus
gui question
0.3 Inference GUI
User Input
#12 opened by kgellhaus
gui
0.3 Inference GUI
Add ground truth images for classification result
#19 opened by kgellhaus
Dataset
0.3 Inference GUI
Option to select specifcally trained model
#13 opened by kgellhaus
gui
0.3 Inference GUI
Compile .ui file script is deprecated
#23 opened by kgellhaus
bug gui
Automated as Done
Manage


1 Open
2 Closed
Sort
0.3 Inference GUI
Due by July 08, 2019
Last updated about 1 hour ago
The first draft of a test UI that utilizes the created models and p…(more)
45% complete
6 open
5 closed
Edit
Close
Delete

TRELLO


GreekNet
Personal
Private
K
MF
Invite
ToDo Software
App Creation
0.3 Milestone
0/2
Add another card
ToDo Organization
Requirements
Specifications
3
Presentation (Result)
2
0/4
Written Report
GPU Cluster Usage
Backup Trello Boards
3
Add another card
In Progress
Inference GUI
9
4/9
Half-time Presentation
Jun 17
Add another card
Review
Analyze Precision of Models
2
1
5/5
Add another card
Done
GUI Dataset Creation
12
1
18/18
K
MF
Dataset Creation
1
5/5
Presentation (Pitch)
May 14
2
Accomplish Milestone 0.1
Jun 1
2
2
Model Transfer Learning DA 8 imgs
3
6/6
Model Transfer Learning DA 16 imgs
2
6/6
Model Transfer Learning 8 imgs
3
6/6
Model Plain DA 8 imgs
4
6/6
Model Transfer Learning 16 imgs
2
6/6
GUI Dataset Statistics
Jun 2
13/13
K
CircleCI
Add another card

TRELLO


GreekNet
Personal
Private
ToDo Software
App Creation
0.3 Milestone
0/2
Add another card
Inference GUI
in list In Progress
Description
Add a more detailed description...
Attachments
b4shy/greek-letter-classifier: Issue #21
Added Jun 5 at 1:44 PM - Comment - Remove - Edit
b4shy/greek-letter-classifier: Issue #19
Added Jun 3 at 4:37 PM - Comment - Remove - Edit
b4shy/greek-letter-classifier: Issue #18
Added Jun 3 at 4:37 PM - Comment - Remove - Edit
b4shy/greek-letter-classifier: Issue #17
Added Jun 3 at 4:37 PM - Comment - Remove - Edit
View all attachments (5 hidden)
Add an attachment
Checklist
Hide completed items
Delete
44%
Design .ui file
Catch keyboard inputs to control UI
'database' with correctly drawn letters to be used for the classification result visualization
Option to select the various trained models
Check drawn input from user with model
Option to save correctly classified sample
Display Top 3 + highlight highest probability
Config (TOML) file that includes annotations to the respective classified letters and the valid pictures
ADD TO CARD
Members
Labels
Checklist
Due Date
Attachment
POWER-UPS
Get Power-Ups
ACTIONS
Move
Copy
Watch
Vote
Archive
Share
Done
GUI Dataset Creation
Dataset Creation
Presentation (Pitch)
Accomplish Milestone 0.1
Model Transfer Learning DA 8 imgs
Model Transfer Learning DA 16 imgs
Model Transfer Learning 8 imgs
Model Plain DA 8 imgs
Model Transfer Learning 16 imgs
GUI Dataset Statistics
CircleCI
Add another card

CIRCLECI

- Commit schlägt fehl, wenn
  - pep8 Syntaxfehler
  - Fehlerhafte Testausführung
  - Code Coverage < 80%
- Gemäß CI/CD Prinzip

README.md

greek-letter-classifier

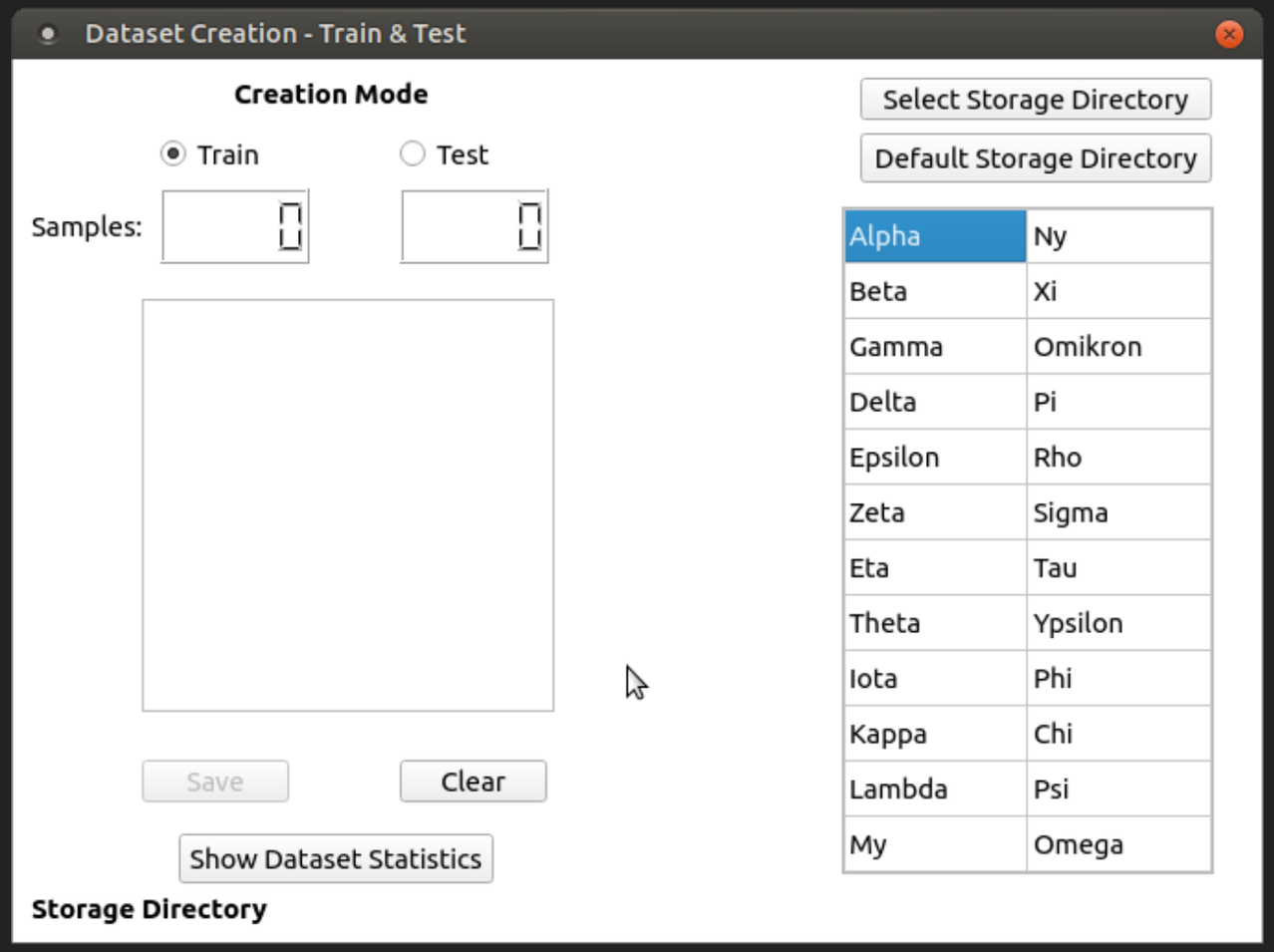
Gui based classifier for greek letters

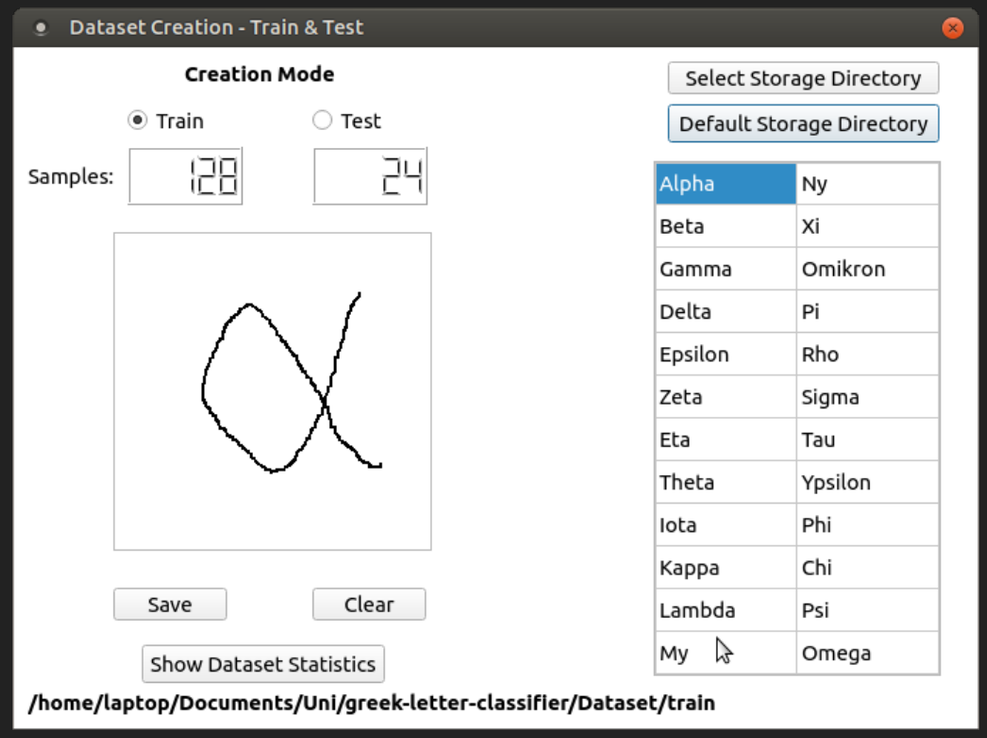
Master: PASSED

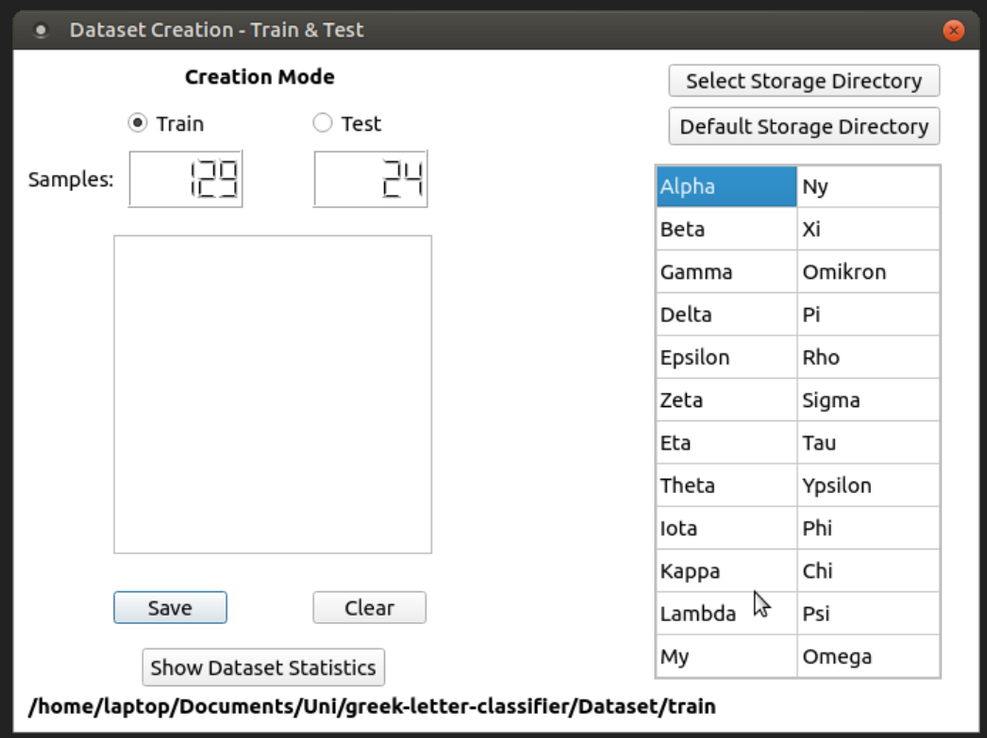
Dev: PASSED

SUCCESS	#137 Test coverage	workflow build	2 days ago	02:06 e31aeef
FAILED	#136 Test coverage	workflow build	2 days ago	01:01 5968724

LABEL GUI


Dataset Creation - Train & Test
Creation Mode
Train
Test
Samples:
0
0
Select Storage Directory
Default Storage Directory
Alpha
Ny
Beta
Xi
Gamma
Omikron
Delta
Pi
Epsilon
Rho
Zeta
Sigma
Eta
Tau
Theta
Ypsilon
Iota
Phi
Kappa
Chi
Lambda
Psi
My
Omega
Save
Clear
Show Dataset Statistics
Storage Directory


Dataset Creation - Train & Test
Creation Mode
Train
Test
Samples:
120
24
Select Storage Directory
Default Storage Directory
Alpha
Ny
Beta
Xi
Gamma
Omikron
Delta
Pi
Epsilon
Rho
Zeta
Sigma
Eta
Tau
Theta
Ypsilon
Iota
Phi
Kappa
Chi
Lambda
Psi
My
Omega
Save
Clear
Show Dataset Statistics
/home/laptop/Documents/Uni/greek-letter-classifier/Dataset/train

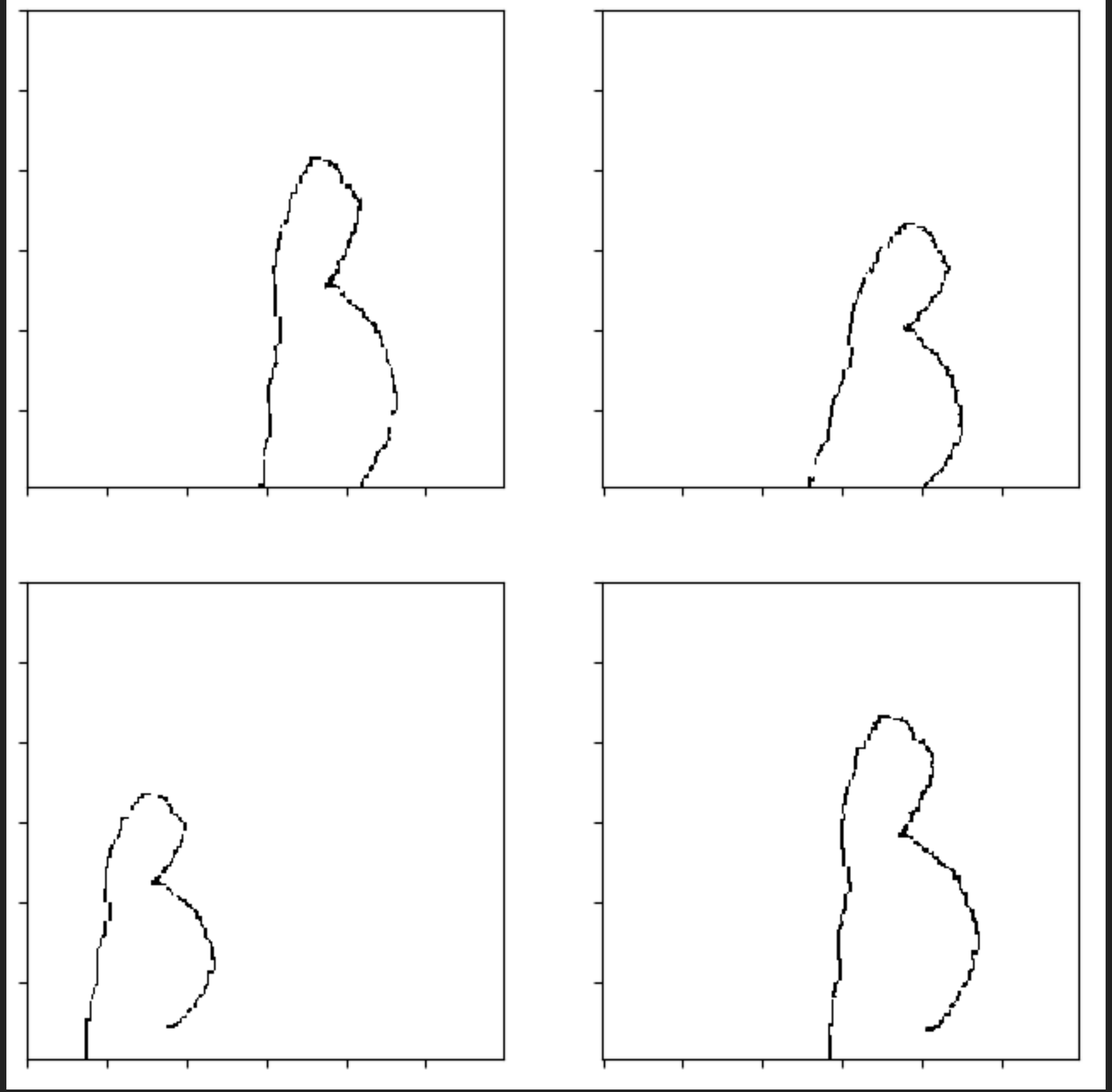

Dataset Creation - Train & Test
Creation Mode
Train
Test
Samples:
129
24
Select Storage Directory
Default Storage Directory
Alpha
Ny
Beta
Xi
Gamma
Omikron
Delta
Pi
Epsilon
Rho
Zeta
Sigma
Eta
Tau
Theta
Ypsilon
Iota
Phi
Kappa
Chi
Lambda
Psi
My
Omega
Save
Clear
Show Dataset Statistics
/home/laptop/Documents/Uni/greek-letter-classifier/Dataset/train

MODELLSTUDIE

1. Wie viel Daten werden benötigt?
   - Transfer Learning
     - Mit Data Augmentation

MODELLSTUDIE

- Data Augmentation - Was ist das?
  - Erzeugen eines größeren Input Spaces durch
    1. Rotation
    2. Vertikale Shifts
    3. Horizontale Shifts
    4. Zooming



MODELLSTUDIE

1. Wie viel Daten werden benötigt?
   - Transfer Learning
     - Mit Data Augmentation
     - Ohne Data Augmentation
   - Randomisierte Initialisierung
     - Mit Data Augmentation → Training fehlgeschlagen / Overfitting
2. Wie effektiv ist Data Augmentation?
3. Welches Modell schlägt sich am besten?

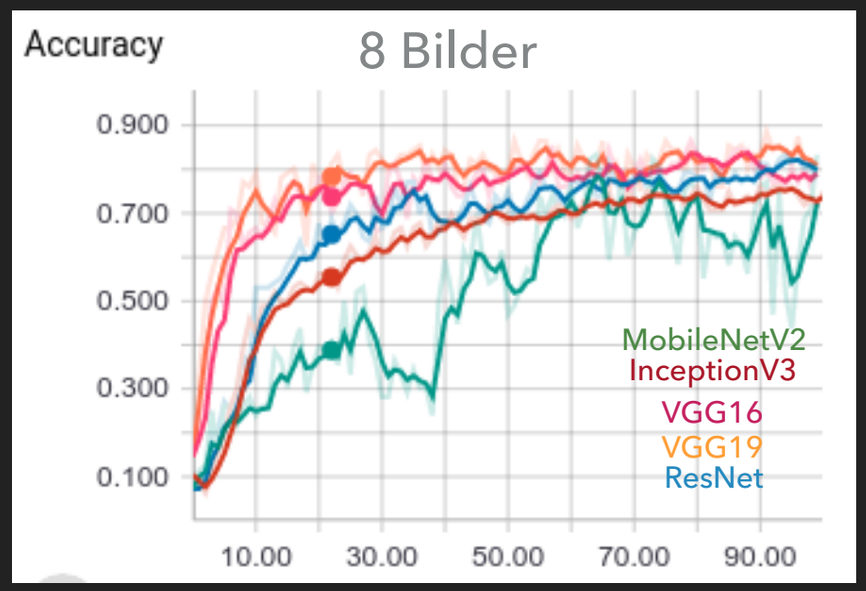
MODELLSTUDIE

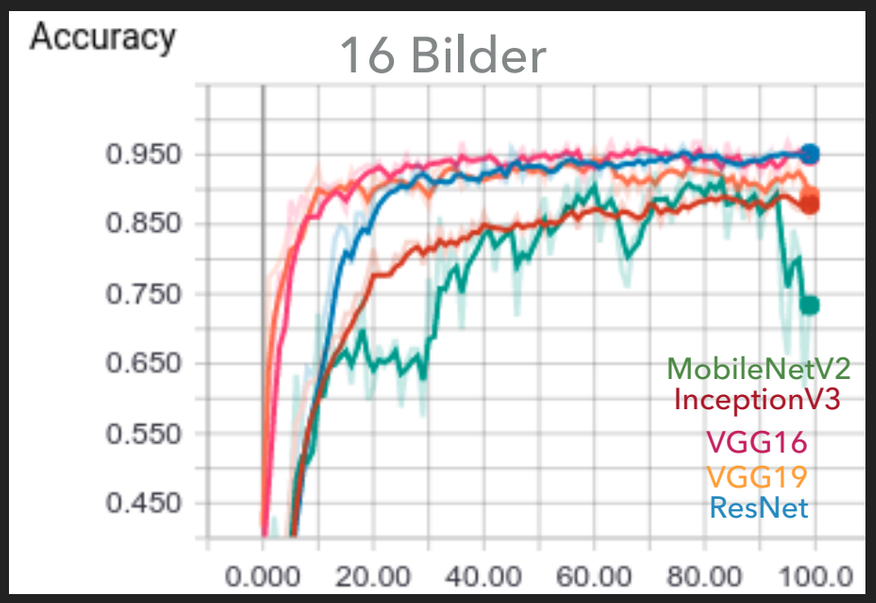
- Verwendete Modelle

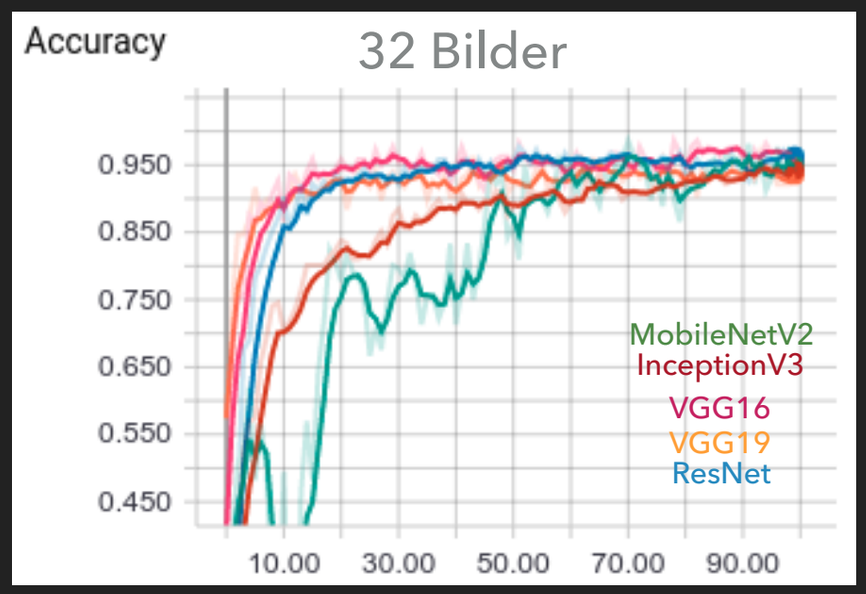
1. InceptionV3[1]
2. ResNet[2]
3. MobileNetV2[3]
4. VGG16[4]
5. VGG19[4]

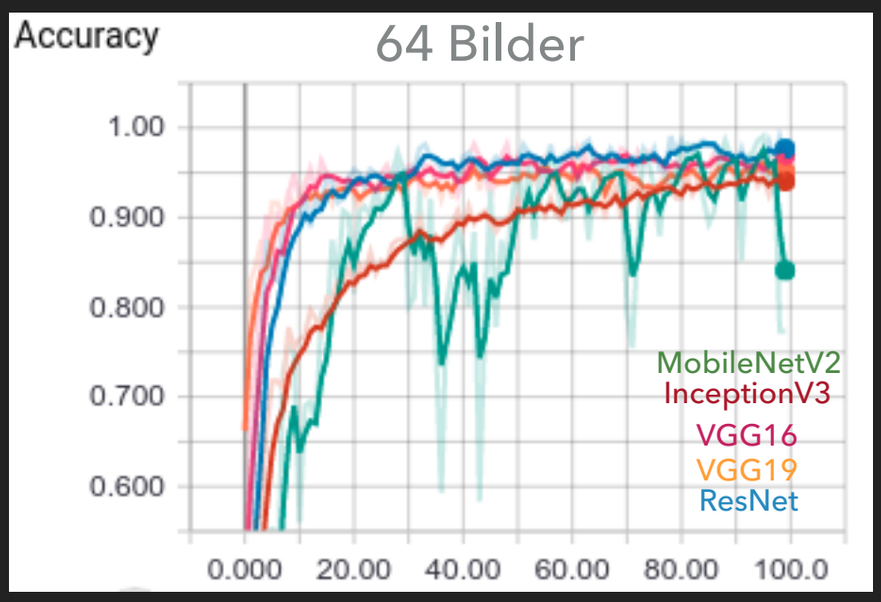
ERGEBNISSE

- Datensatzgröße (Ergebnisse mit Data Augmentation)







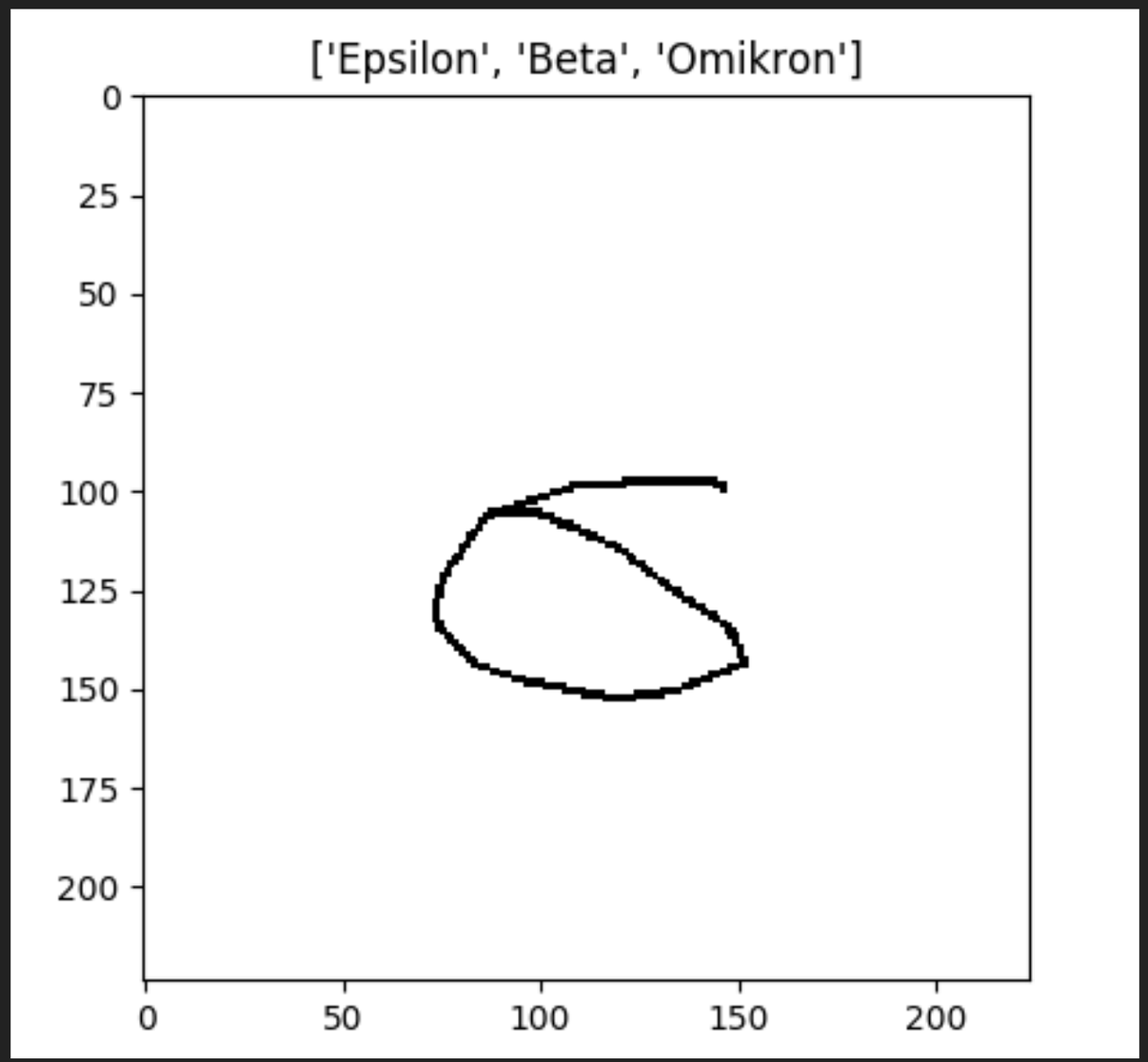


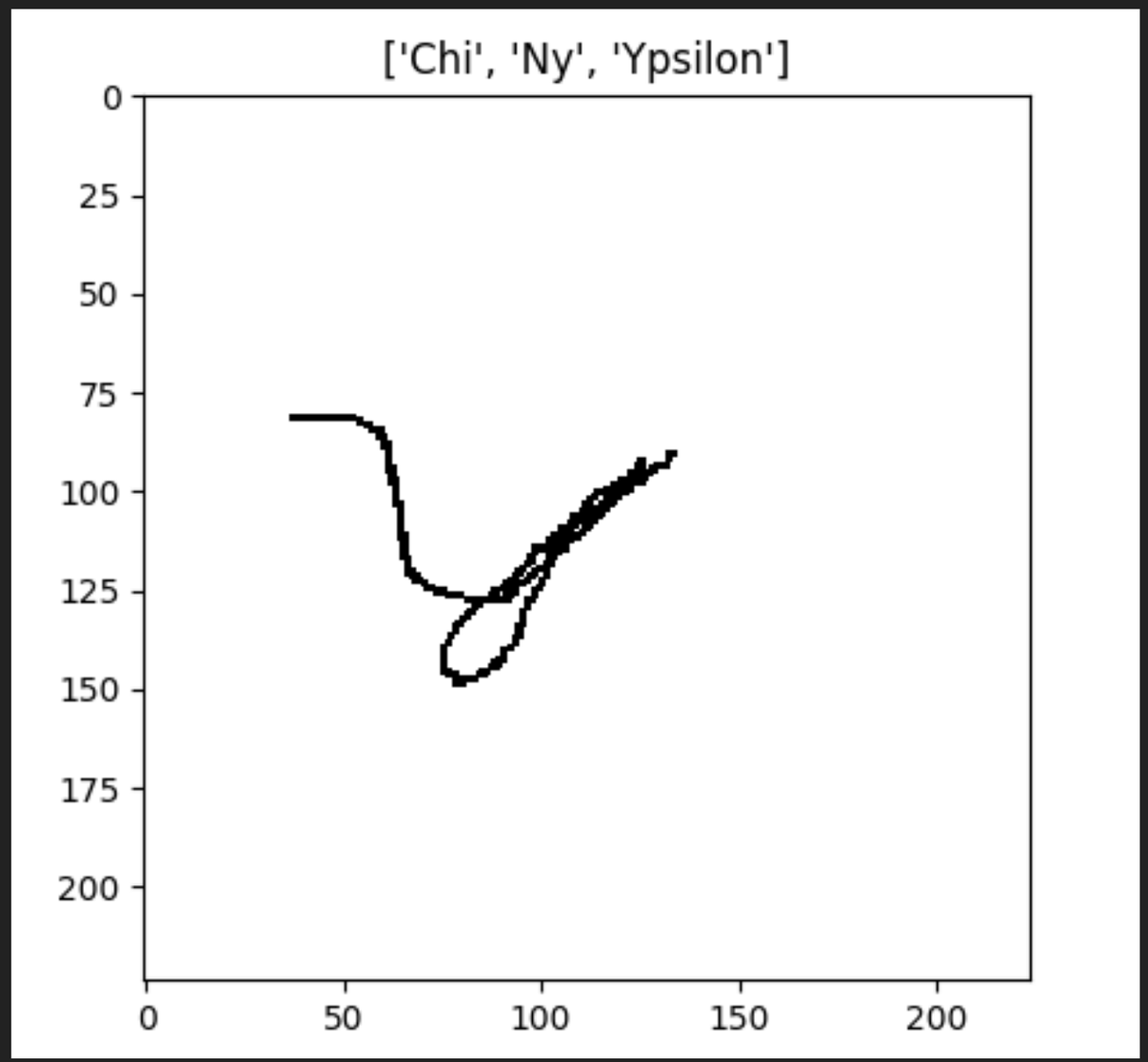
ERGEBNISSE

- Datensatzgröße
  - 16 Samples pro Klasse liefern bereits sehr gute Ergebnisse
- ResNet bestes Ergebnis - 97.67% bei 576 Testdaten
  - 99.7% Top-3-Genauigkeit

ERGEBNISSE

- ResNet insg. zwei falsche Top-3 Klassifikationen

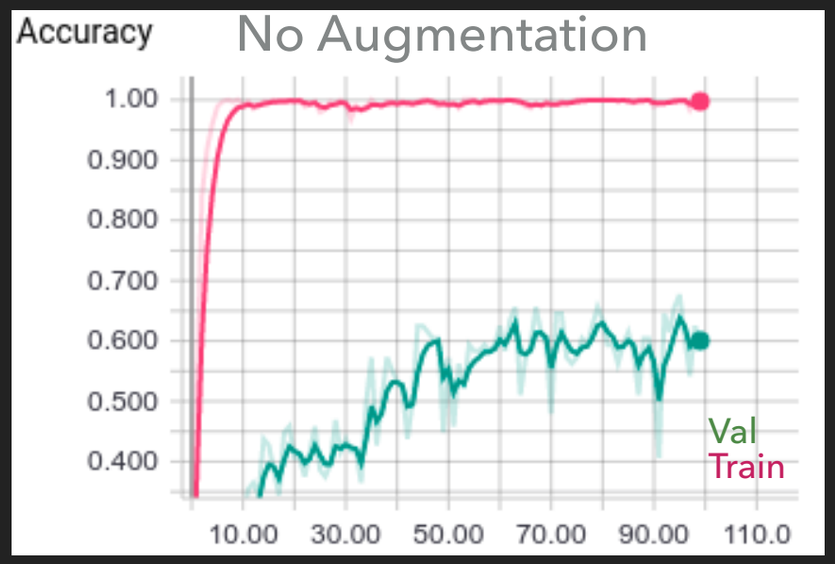


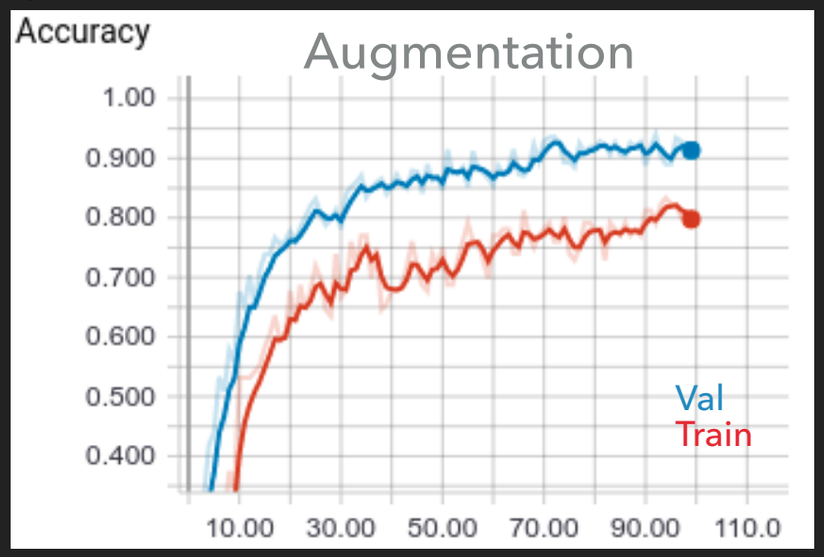


ERGEBNISSE

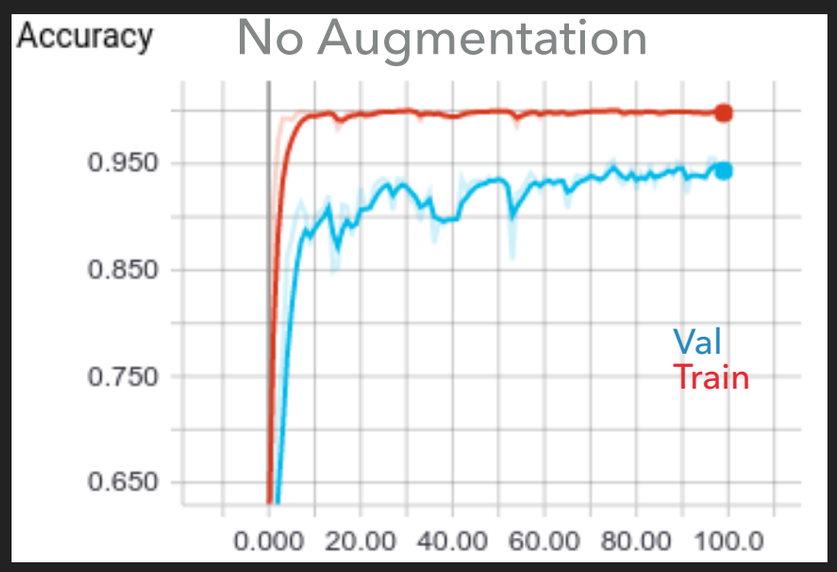
- Augmentation Vergleich:

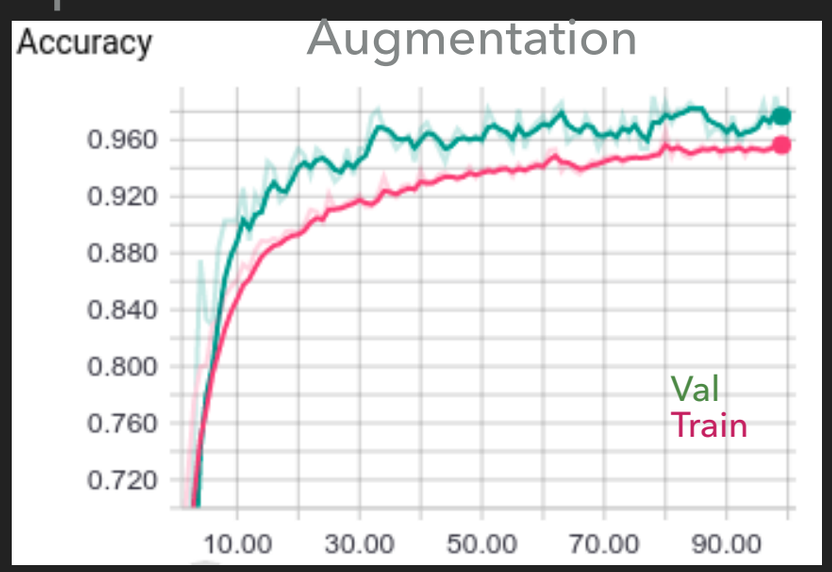
ResNet mit 8 Samples



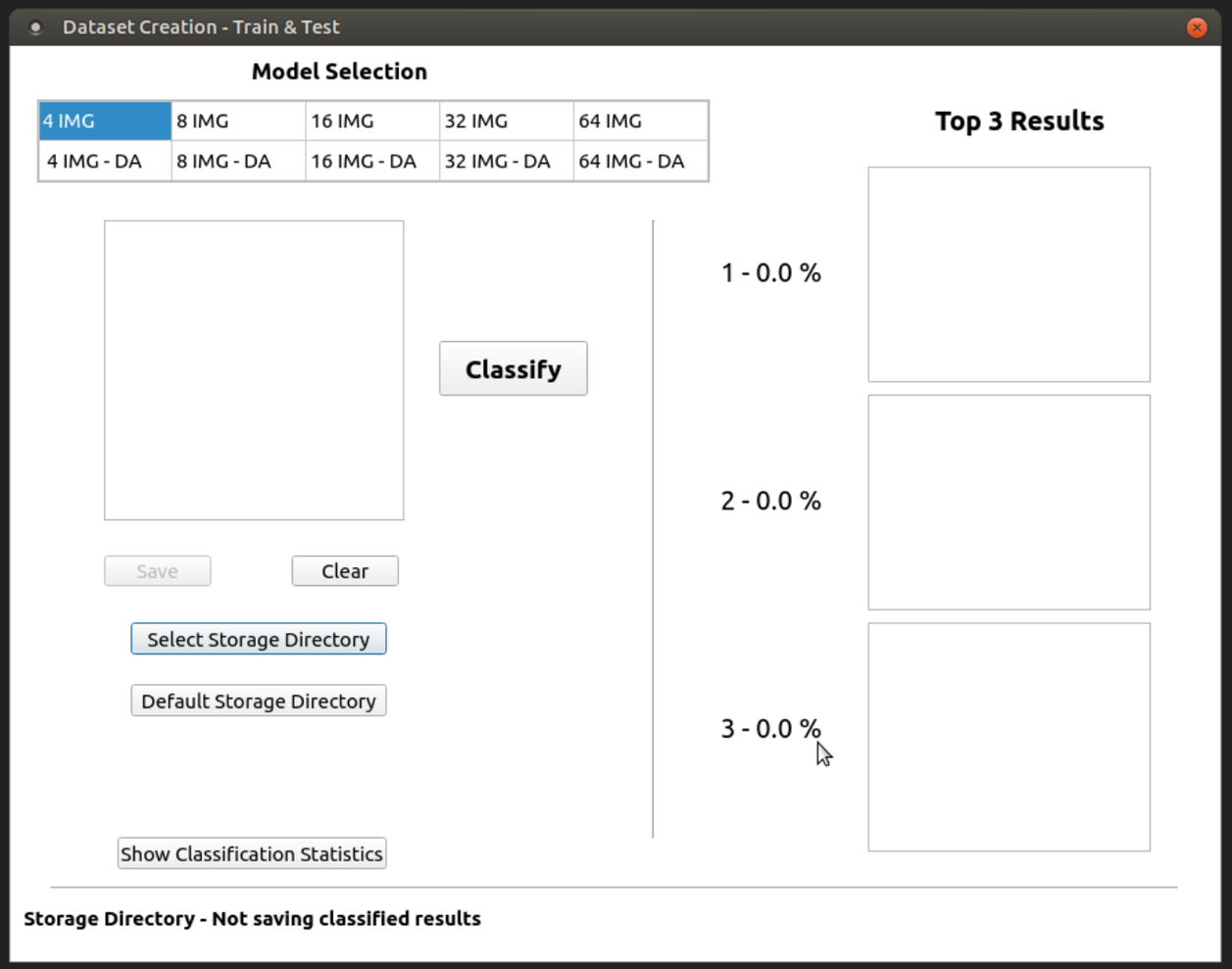


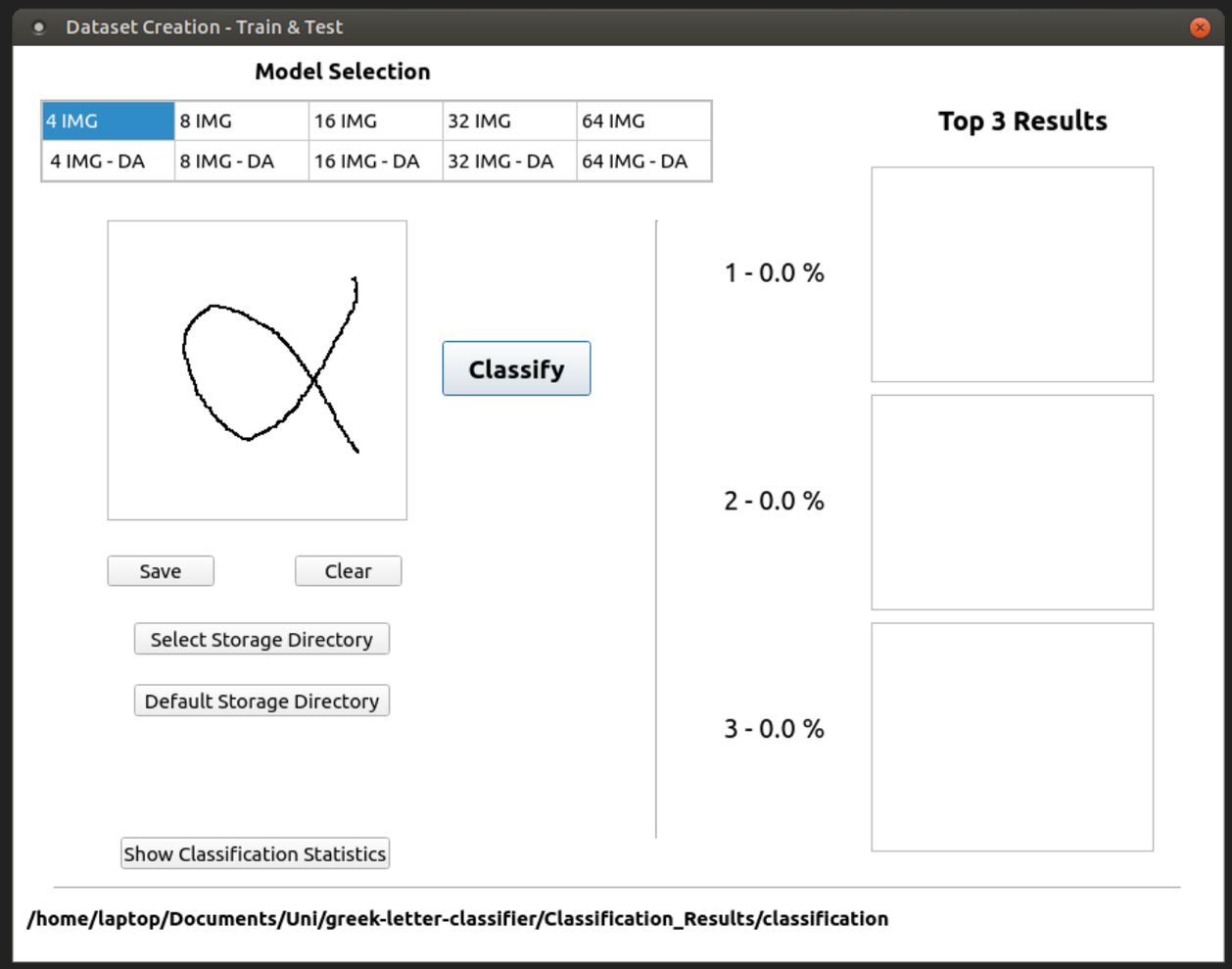
ResNet mit 64 Samples



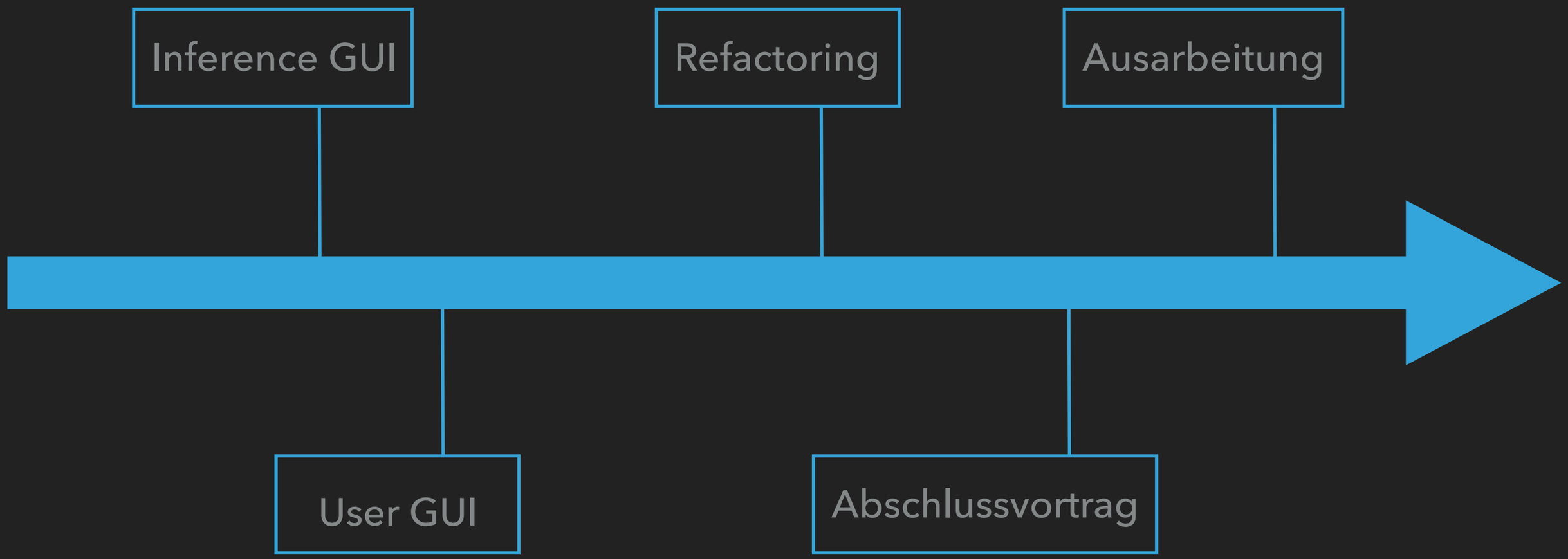


INFERENCE GUI





WAS NUN?


Inference GUI
Refactoring
Ausarbeitung
User GUI
Abschlussvortrag

LITERATURVERZEICHNIS

1. InceptionV3: arXiv:1512.00567
2. ResNet: arXiv:1512.03385
3. MobileNetV2: arXiv:1801.04381
4. VGG: arXiv:1409.1556