Universität Rostock
Traditio et Innovatio

CITlab
Computational Intelligence Technology

READ

HTR+ in Transkribus

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Topics

- Technical Comparison HTR vs. HTR+
- Performance Comparison HTR vs. HTR+
- Best Practice
- Discussion

Technical Comparison HTR vs. HTR+

First: What stays unchanged?

- **input:** image
- **output:** text and ConfMat
- trained with Connectionist Temporal Classification (CTC)

$\Rightarrow$ The existing workflow stays untouched

Main technical between HTR and HTR+

- **change Software:** from proprietary to TensorFlow
- **change Hardware:** from CPU-training to GPU-training
- **change Neural Network:** deeper and larger
- **change Proprocess:** simpler and faster

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The Architecture

Input-Output-Mapping by HTR+

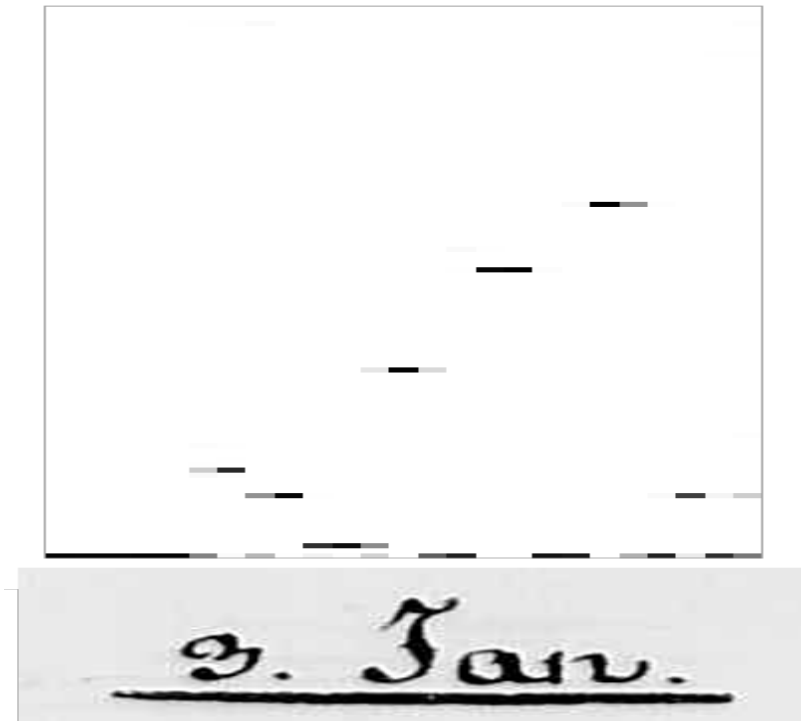


Figure: An example of the input (image) and output (ConfMat)

Hierarchical approach

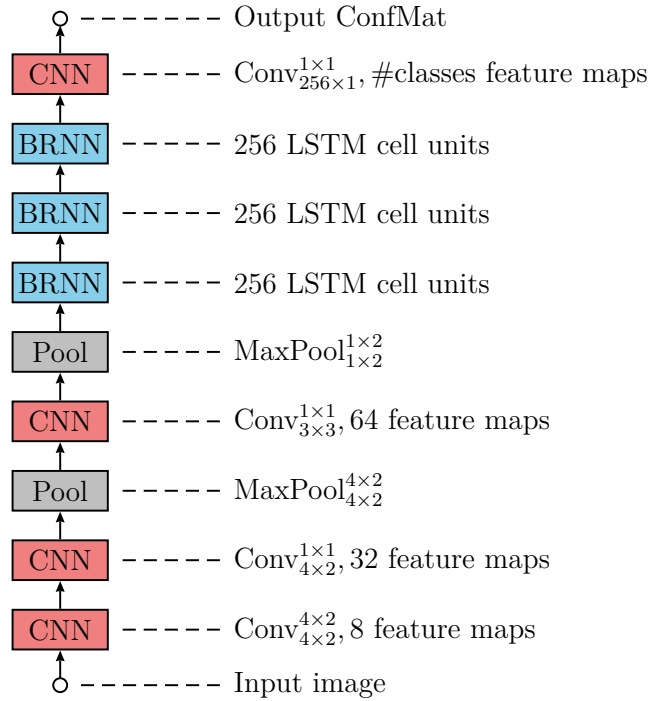


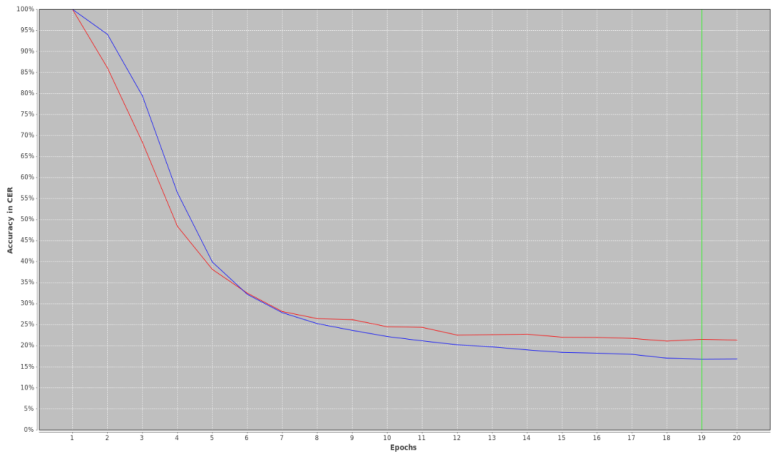
Figure: The layers are stacked to guarantee a meaningful step-wise mapping between input and output.

Performance Comparison HTR vs. HTR+

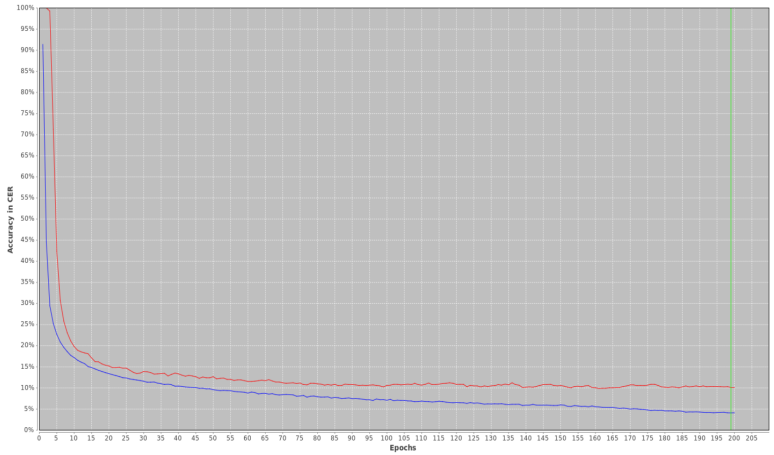
Edelfeld (642 pages)

	CER train	CER val	training time	training lines
HTR	16.83%	21.11%	20h 57m	200,000
HTR+	4.09%	9.86%	5h 41m	1,638,400

HTR



HTR+

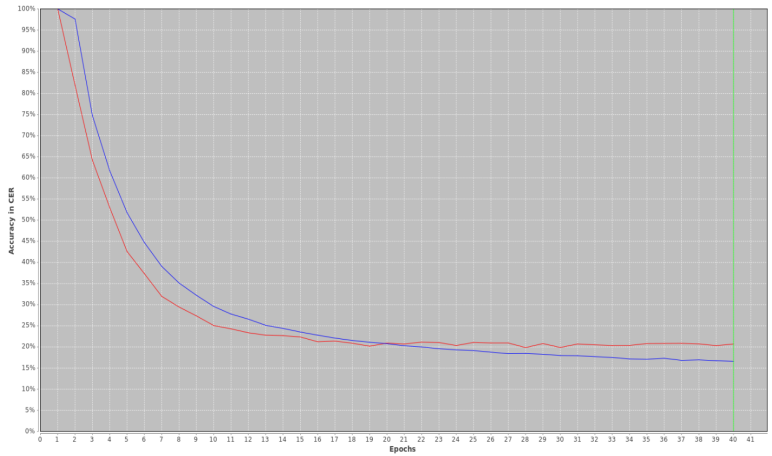


Performance Comparison HTR vs. HTR+

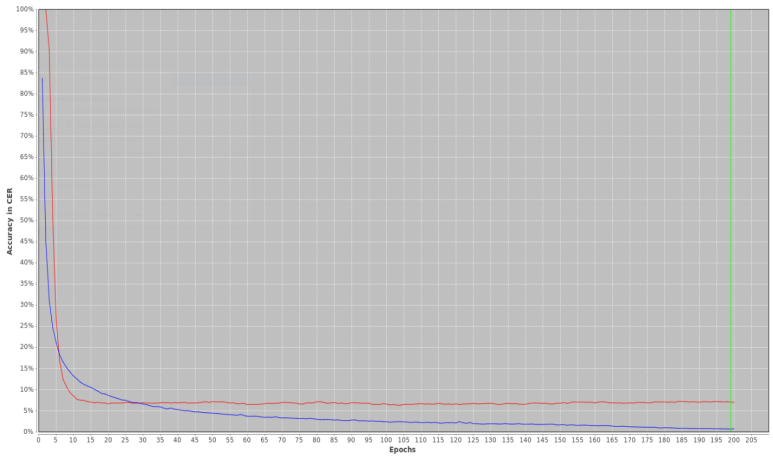
ABP OA Protokolle (48 pages)

	CER train	CER val	training time	training lines
HTR	16.59%	19.84%	9h 54m	400,000
HTR+	0.72%	6.35%	3h 59m	1,638,400

HTR



HTR+

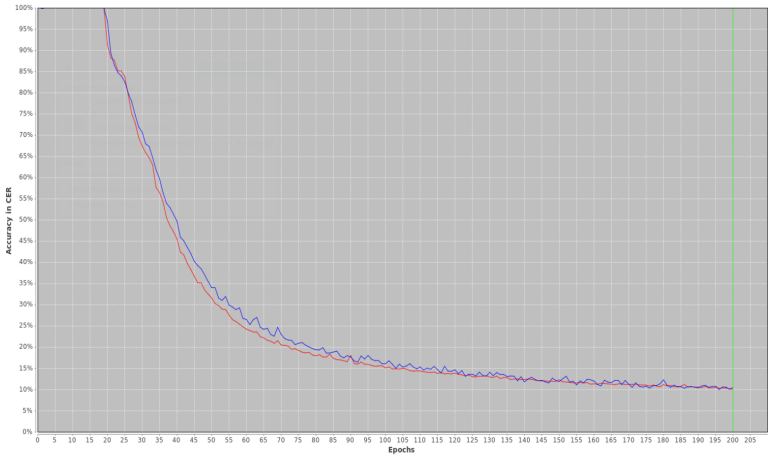


Performance Comparison HTR vs. HTR+

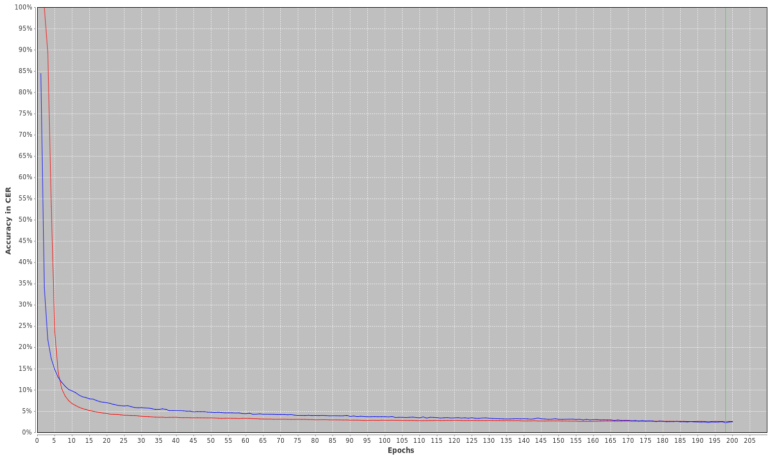
Konzilsprotokolle (2135 pages)

	CER train	CER val	training time	training lines
HTR	10.51%	10.08%	20h 06m	200,000
HTR+	2.30%	2.62%	8h 44m	1,638,400

HTR



HTR+



Comparison HTR ⇒ HTR+

Conclusion

- training speed acceleration by factor 10 to 100
- relative CER-reduction by 50% to 75%

Best Practice

GT quality

- The more GT the better
- **The better GT the better**

⇒ define rules, how to transcribe text

Best Practice

Same transcription for same character

sehen, seineswegs

⇔

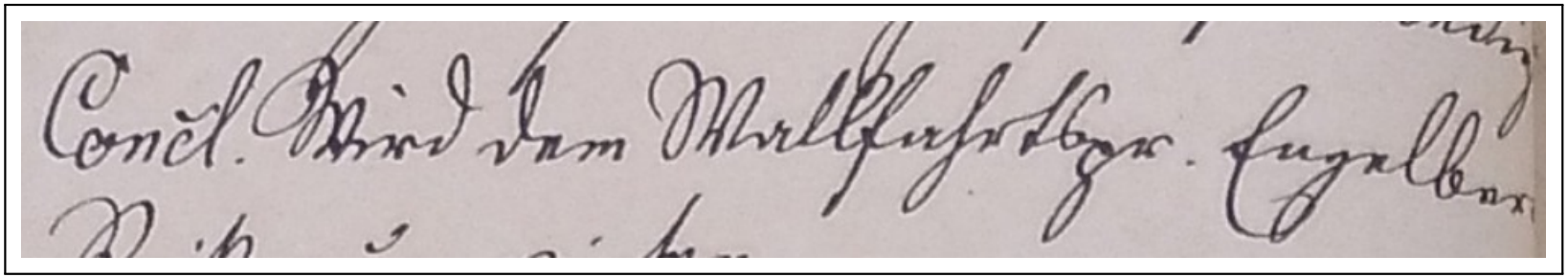
ſehen, seineswegs

⇔

ſehen, ſeineswegs

Best Practice

Transcribe diplomatic, not modernized



Conclusion Wird dem Wallfahrtsprecher Engelbert

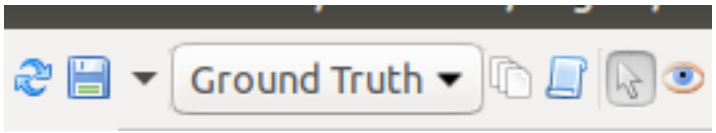
$\Leftrightarrow$

Concl. Wird dem Wallfahrtspr. Engelbert

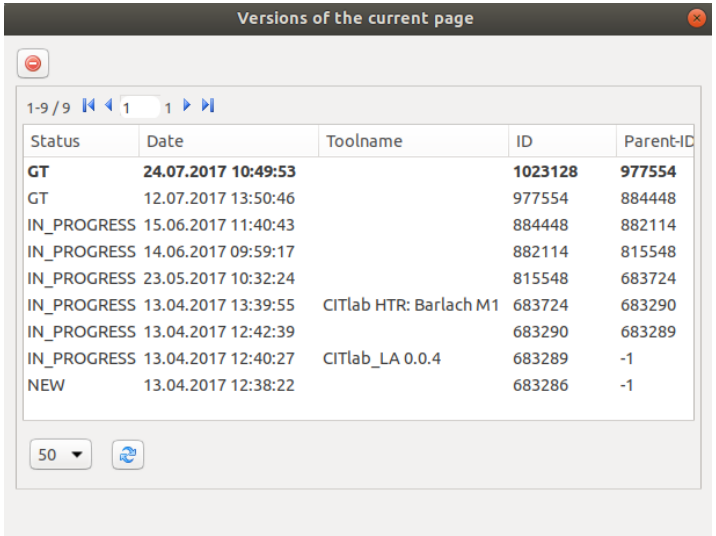
Best Practice

Do not train with wrong transcripts

- set **Status** = **Ground Truth** of transcibed pages and use checkbox **use Groundtruth versions** in training setup



- check that the latest version of your transcription is **NOT an HTR result**

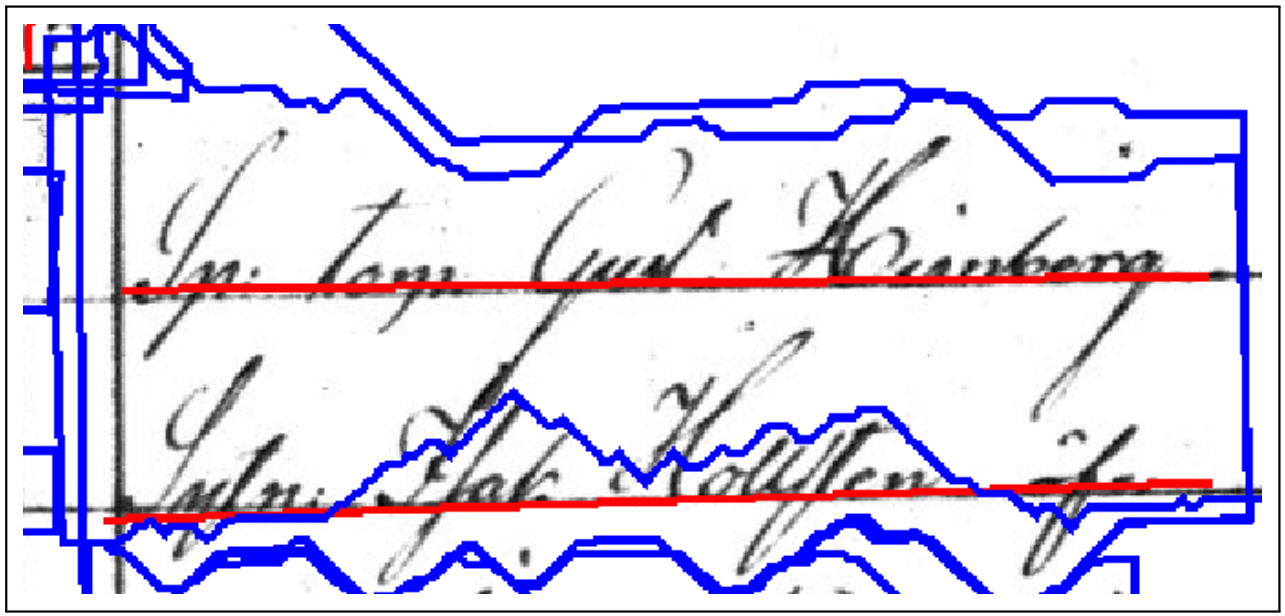


Status	Date	Toolname	ID	Parent-ID
GT	**24.07.2017 10:49:53**		**1023128**	**977554**
GT	12.07.2017 13:50:46		977554	884448
IN_PROGRESS	15.06.2017 11:40:43		884448	882114
IN_PROGRESS	14.06.2017 09:59:17		882114	815548
IN_PROGRESS	23.05.2017 10:32:24		815548	683724
IN_PROGRESS	13.04.2017 13:39:55	CITlab HTR: Barlach M1	683724	683290
IN_PROGRESS	13.04.2017 12:42:39		683290	683289
IN_PROGRESS	13.04.2017 12:40:27	CITlab_LA 0.0.4	683289	-1
NEW	13.04.2017 12:38:22		683286	-1

Best Practice

When HTR has bad performance

Sometimes HTR is good, but polygon creation fails



but...

We will improve that in the next month!

Best Practice

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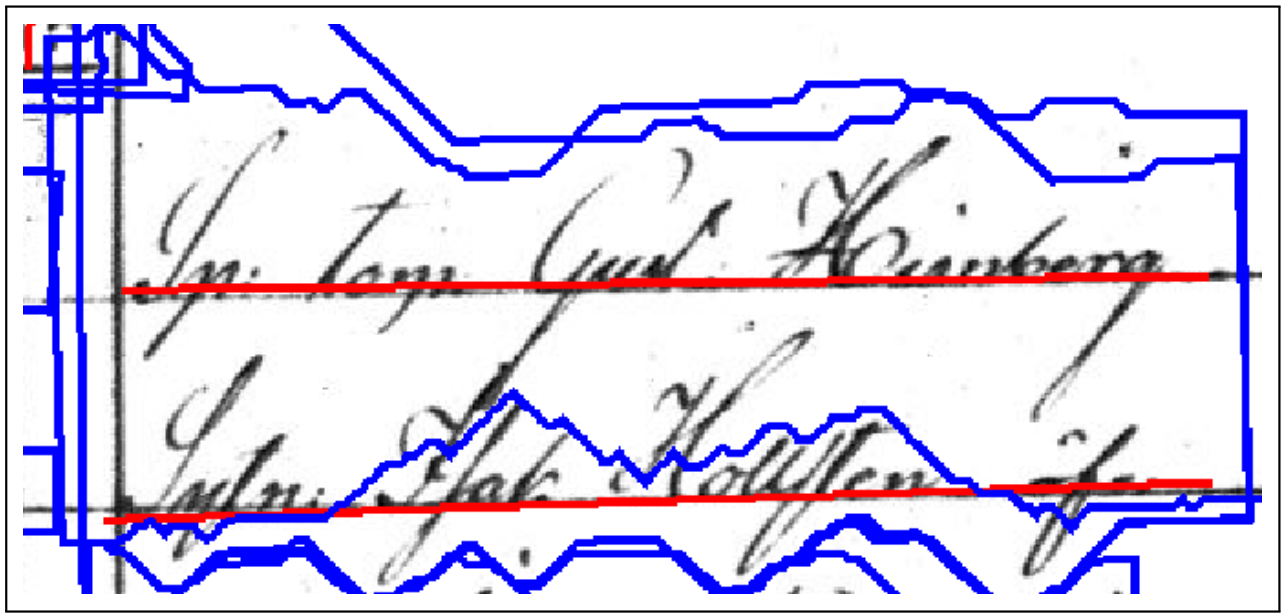

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Thank you!

Questions?