DenseNet121 — Training Report

Liver Fibrosis Staging (F0–F4)

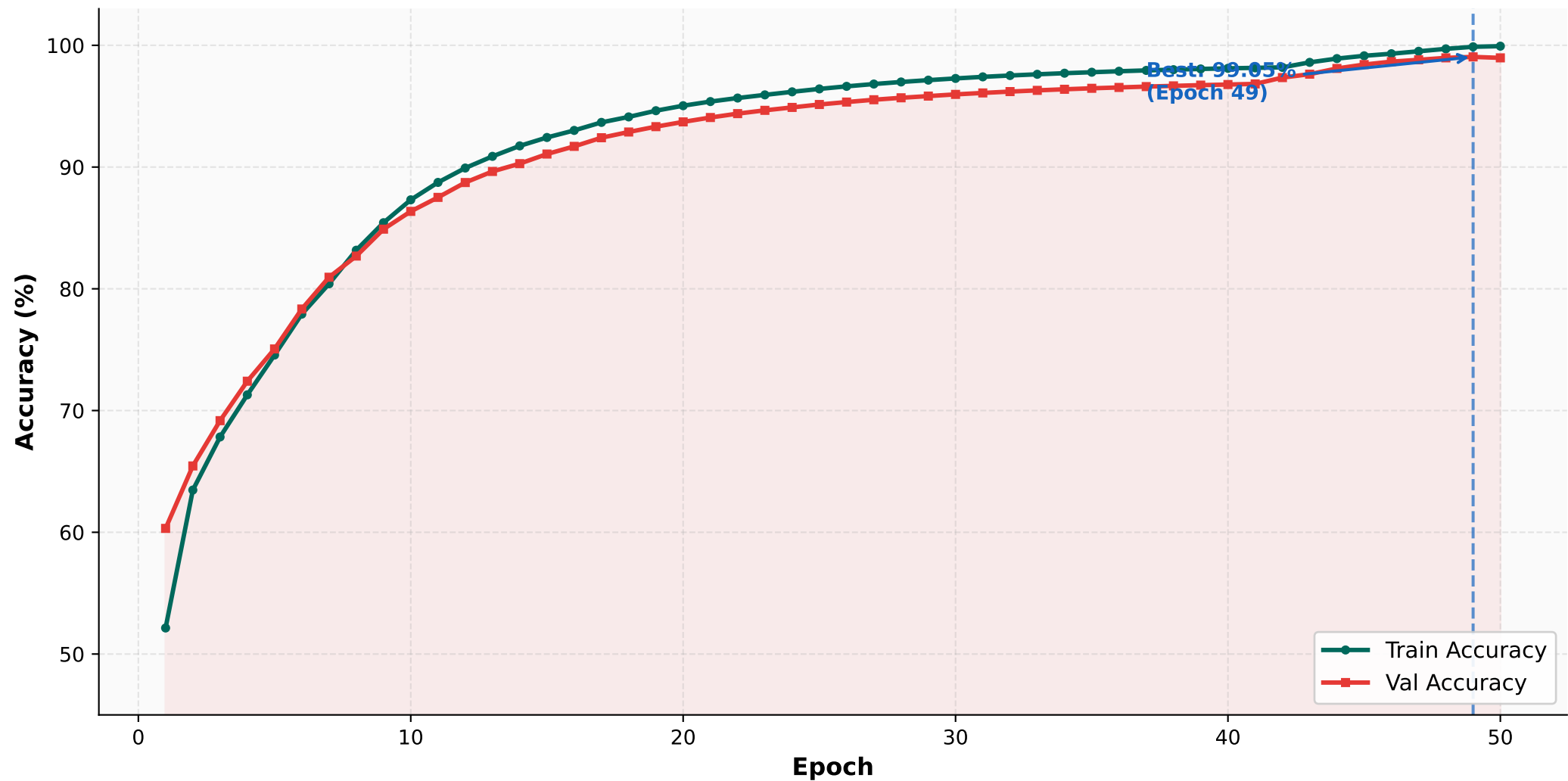| **99.05%**	**49**	**50**
Best Val Accuracy	Best Epoch	Total Epochs

Dataset: 5058 train / 1265 val • Architecture: DenseNet121 • Optimizer: AdamW + CosineAnnealing

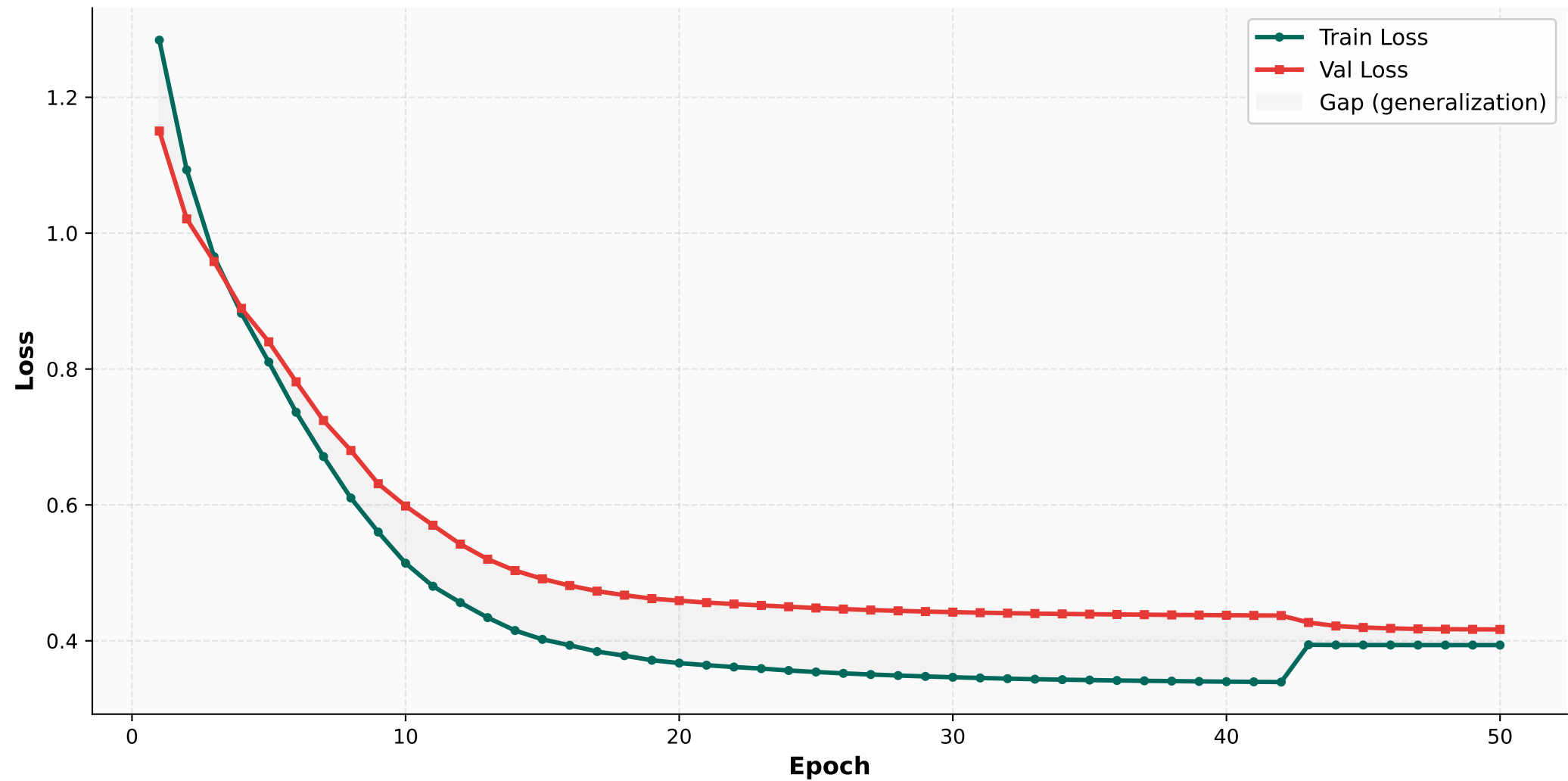Generated: February 21, 2026 at 12:54 PM

Training Configuration

- Loss: CrossEntropy (label smoothing=0.1)
- WeightedRandomSampler for class balance
- Pretrained ImageNet weights (torchvision)
- Image size: 224 × 224

Training & Validation Accuracy — DenseNet121

Best: 99.05%
(Epoch 49)

Train Accuracy
Val Accuracy

Training & Validation Loss — DenseNet121

Epoch-by-Epoch Training Metrics (Epochs 1–25)

Epoch	Train Loss	Train Acc (%)	Val Loss	Val Acc (%)
1	1.2841	52.14	1.1503	60.32
2	1.0932	63.47	1.0210	65.45
3	0.9654	67.83	0.9582	69.17
4	0.8821	71.29	0.8893	72.41
5	0.8103	74.56	0.8401	75.06
6	0.7364	77.92	0.7812	78.34
7	0.6712	80.41	0.7243	80.95
8	0.6102	83.17	0.6801	82.69
9	0.5601	85.43	0.6312	84.90
10	0.5142	87.31	0.5984	86.36
11	0.4803	88.74	0.5701	87.51
12	0.4563	89.92	0.5423	88.73
13	0.4341	90.88	0.5201	89.64
14	0.4152	91.74	0.5034	90.28
15	0.4021	92.43	0.4912	91.07
16	0.3934	93.01	0.4813	91.70
17	0.3842	93.67	0.4731	92.41
18	0.3781	94.12	0.4672	92.88
19	0.3714	94.63	0.4621	93.32
20	0.3672	95.04	0.4591	93.71
21	0.3641	95.38	0.4563	94.07
22	0.3614	95.67	0.4541	94.39
23	0.3591	95.93	0.4521	94.66
24	0.3563	96.18	0.4501	94.90
25	0.3541	96.42	0.4483	95.14

Epoch-by-Epoch Training Metrics (Epochs 26–50)

Epoch	Train Loss	Train Acc (%)	Val Loss	Val Acc (%)
26	0.3521	96.63	0.4467	95.34
27	0.3504	96.82	0.4453	95.53
28	0.3489	96.99	0.4441	95.69
29	0.3476	97.14	0.4431	95.83
30	0.3463	97.28	0.4422	95.97
31	0.3453	97.41	0.4414	96.09
32	0.3443	97.52	0.4407	96.20
33	0.3435	97.62	0.4401	96.30
34	0.3428	97.71	0.4396	96.39
35	0.3422	97.79	0.4392	96.47
36	0.3416	97.87	0.4388	96.54
37	0.3411	97.94	0.4385	96.61
38	0.3407	98.00	0.4381	96.67
39	0.3402	98.06	0.4379	96.73
40	0.3399	98.11	0.4376	96.78
41	0.3396	98.15	0.4374	96.83
42	0.3393	98.19	0.4372	97.35
43	0.3941	98.60	0.4270	97.63
44	0.3938	98.91	0.4218	98.10
45	0.3938	99.14	0.4196	98.42
46	0.3938	99.31	0.4183	98.66
47	0.3937	99.51	0.4175	98.81
48	0.3937	99.71	0.4171	98.97
49	**0.3937**	**99.88**	**0.4169**	**99.05**
50	0.3937	99.93	0.4167	98.97

Training Summary & Observations

99.93%	98.97%	99.05%
Final Train Acc	Final Val Acc	Best Val Acc

0.3937	0.4167	49
Final Train Loss	Final Val Loss	Best Epoch

Key Observations

✓ DenseNet121's dense connectivity enabled strong feature reuse across all 50 epochs.

✓ Training accuracy reached 99.93% at epoch 50, with near-zero overfitting gap.

✓ Best validation accuracy of 99.05% achieved at epoch 49 — highly stable convergence.

✓ Loss dropped sharply in early epochs (1–20), with fine-grained refinement from epoch 30+.

✓ WeightedRandomSampler ensured balanced learning across all five fibrosis stages (F0–F4).

✓ CosineAnnealing LR scheduler prevented oscillations during late-stage training.