Network\_32\_64\_2

Layer (type) Output Shape Param #

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dense\_1 (Dense) (None, 32) 64

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dense\_2 (Dense) (None, 64) 2112

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dense\_3 (Dense) (None, 2) 130

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Total params: 2,306

Trainable params: 2,306

Non-trainable params: 0

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Train on 1890 samples, validate on 210 samples

Epoch 1/30

- 1s - loss: 0.6831 - acc: 0.4931 - val\_loss: 0.6586 - val\_acc: 0.5714

Epoch 2/30

- 0s - loss: 0.6279 - acc: 0.6185 - val\_loss: 0.6171 - val\_acc: 0.6333

Epoch 3/30

- 0s - loss: 0.5795 - acc: 0.7000 - val\_loss: 0.5735 - val\_acc: 0.7190

Epoch 4/30

- 0s - loss: 0.5324 - acc: 0.7772 - val\_loss: 0.5351 - val\_acc: 0.7619

Epoch 5/30

- 0s - loss: 0.4882 - acc: 0.8206 - val\_loss: 0.4989 - val\_acc: 0.7857

Epoch 6/30

- 0s - loss: 0.4473 - acc: 0.8455 - val\_loss: 0.4630 - val\_acc: 0.8333

Epoch 7/30

- 0s - loss: 0.4096 - acc: 0.8688 - val\_loss: 0.4316 - val\_acc: 0.8667

Epoch 8/30

- 0s - loss: 0.3775 - acc: 0.8899 - val\_loss: 0.4078 - val\_acc: 0.8810

Epoch 9/30

- 0s - loss: 0.3508 - acc: 0.9032 - val\_loss: 0.3898 - val\_acc: 0.8952

Epoch 10/30

- 0s - loss: 0.3295 - acc: 0.9122 - val\_loss: 0.3767 - val\_acc: 0.8952

Epoch 11/30

- 0s - loss: 0.3127 - acc: 0.9196 - val\_loss: 0.3666 - val\_acc: 0.9000

Epoch 12/30

- 0s - loss: 0.3000 - acc: 0.9249 - val\_loss: 0.3594 - val\_acc: 0.9048

Epoch 13/30

- 0s - loss: 0.2905 - acc: 0.9249 - val\_loss: 0.3540 - val\_acc: 0.9048

Epoch 14/30

- 0s - loss: 0.2821 - acc: 0.9349 - val\_loss: 0.3556 - val\_acc: 0.9000

Epoch 15/30

- 0s - loss: 0.2770 - acc: 0.9280 - val\_loss: 0.3498 - val\_acc: 0.9048

Epoch 16/30

- 0s - loss: 0.2719 - acc: 0.9333 - val\_loss: 0.3465 - val\_acc: 0.9143

Epoch 17/30

- 0s - loss: 0.2681 - acc: 0.9339 - val\_loss: 0.3455 - val\_acc: 0.9143

Epoch 18/30

- 0s - loss: 0.2646 - acc: 0.9381 - val\_loss: 0.3441 - val\_acc: 0.9143

Epoch 19/30

- 0s - loss: 0.2618 - acc: 0.9397 - val\_loss: 0.3467 - val\_acc: 0.9048

Epoch 20/30

- 0s - loss: 0.2601 - acc: 0.9339 - val\_loss: 0.3430 - val\_acc: 0.9143

Epoch 21/30

- 0s - loss: 0.2575 - acc: 0.9397 - val\_loss: 0.3420 - val\_acc: 0.9143

Epoch 22/30

- 0s - loss: 0.2552 - acc: 0.9370 - val\_loss: 0.3387 - val\_acc: 0.9238

Epoch 23/30

- 0s - loss: 0.2536 - acc: 0.9434 - val\_loss: 0.3395 - val\_acc: 0.9143

Epoch 24/30

- 0s - loss: 0.2523 - acc: 0.9407 - val\_loss: 0.3387 - val\_acc: 0.9143

Epoch 25/30

- 0s - loss: 0.2506 - acc: 0.9397 - val\_loss: 0.3365 - val\_acc: 0.9238

Epoch 26/30

- 0s - loss: 0.2494 - acc: 0.9418 - val\_loss: 0.3371 - val\_acc: 0.9143

Epoch 27/30

- 0s - loss: 0.2479 - acc: 0.9429 - val\_loss: 0.3374 - val\_acc: 0.9143

Epoch 28/30

- 0s - loss: 0.2471 - acc: 0.9402 - val\_loss: 0.3352 - val\_acc: 0.9143

Epoch 29/30

- 0s - loss: 0.2456 - acc: 0.9413 - val\_loss: 0.3334 - val\_acc: 0.9238

Epoch 30/30

- 0s - loss: 0.2447 - acc: 0.9444 - val\_loss: 0.3325 - val\_acc: 0.9238

Confusion matrix, without normalization

[[197 13]

[ 10 200]]

Network\_64\_128\_2

Layer (type) Output Shape Param #

=================================================================

dense\_4 (Dense) (None, 64) 128

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dense\_5 (Dense) (None, 128) 8320

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dense\_6 (Dense) (None, 2) 258

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Total params: 8,706

Trainable params: 8,706

Non-trainable params: 0

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Train on 1890 samples, validate on 210 samples

Epoch 1/30

- 1s - loss: 0.6586 - acc: 0.5889 - val\_loss: 0.6277 - val\_acc: 0.6952

Epoch 2/30

- 0s - loss: 0.5979 - acc: 0.7286 - val\_loss: 0.5620 - val\_acc: 0.7905

Epoch 3/30

- 0s - loss: 0.5277 - acc: 0.8005 - val\_loss: 0.4941 - val\_acc: 0.8524

Epoch 4/30

- 0s - loss: 0.4557 - acc: 0.8593 - val\_loss: 0.4288 - val\_acc: 0.8762

Epoch 5/30

- 0s - loss: 0.3909 - acc: 0.8910 - val\_loss: 0.3825 - val\_acc: 0.9095

Epoch 6/30

- 0s - loss: 0.3442 - acc: 0.9127 - val\_loss: 0.3456 - val\_acc: 0.8905

Epoch 7/30

- 0s - loss: 0.3136 - acc: 0.9153 - val\_loss: 0.3302 - val\_acc: 0.9238

Epoch 8/30

- 0s - loss: 0.2945 - acc: 0.9312 - val\_loss: 0.3141 - val\_acc: 0.9095

Epoch 9/30

- 0s - loss: 0.2819 - acc: 0.9312 - val\_loss: 0.3118 - val\_acc: 0.9238

Epoch 10/30

- 0s - loss: 0.2738 - acc: 0.9354 - val\_loss: 0.3027 - val\_acc: 0.9190

Epoch 11/30

- 0s - loss: 0.2676 - acc: 0.9376 - val\_loss: 0.2964 - val\_acc: 0.9190

Epoch 12/30

- 0s - loss: 0.2641 - acc: 0.9381 - val\_loss: 0.2942 - val\_acc: 0.9190

Epoch 13/30

- 0s - loss: 0.2604 - acc: 0.9370 - val\_loss: 0.2971 - val\_acc: 0.9238

Epoch 14/30

- 0s - loss: 0.2575 - acc: 0.9429 - val\_loss: 0.2952 - val\_acc: 0.9238

Epoch 15/30

- 0s - loss: 0.2554 - acc: 0.9429 - val\_loss: 0.2902 - val\_acc: 0.9238

Epoch 16/30

- 0s - loss: 0.2536 - acc: 0.9413 - val\_loss: 0.2906 - val\_acc: 0.9238

Epoch 17/30

- 0s - loss: 0.2520 - acc: 0.9434 - val\_loss: 0.2884 - val\_acc: 0.9238

Epoch 18/30

- 0s - loss: 0.2504 - acc: 0.9460 - val\_loss: 0.2847 - val\_acc: 0.9190

Epoch 19/30

- 0s - loss: 0.2497 - acc: 0.9429 - val\_loss: 0.2857 - val\_acc: 0.9238

Epoch 20/30

- 0s - loss: 0.2487 - acc: 0.9439 - val\_loss: 0.2844 - val\_acc: 0.9238

Epoch 21/30

- 0s - loss: 0.2471 - acc: 0.9413 - val\_loss: 0.2907 - val\_acc: 0.9381

Epoch 22/30

- 0s - loss: 0.2467 - acc: 0.9466 - val\_loss: 0.2825 - val\_acc: 0.9238

Epoch 23/30

- 0s - loss: 0.2459 - acc: 0.9460 - val\_loss: 0.2822 - val\_acc: 0.9238

Epoch 24/30

- 0s - loss: 0.2452 - acc: 0.9439 - val\_loss: 0.2842 - val\_acc: 0.9238

Epoch 25/30

- 0s - loss: 0.2444 - acc: 0.9439 - val\_loss: 0.2849 - val\_acc: 0.9381

Epoch 26/30

- 0s - loss: 0.2436 - acc: 0.9439 - val\_loss: 0.2860 - val\_acc: 0.9381

Epoch 27/30

- 0s - loss: 0.2433 - acc: 0.9508 - val\_loss: 0.2806 - val\_acc: 0.9238

Epoch 28/30

- 0s - loss: 0.2426 - acc: 0.9471 - val\_loss: 0.2841 - val\_acc: 0.9381

Epoch 29/30

- 0s - loss: 0.2420 - acc: 0.9455 - val\_loss: 0.2825 - val\_acc: 0.9381

Epoch 30/30

- 0s - loss: 0.2416 - acc: 0.9460 - val\_loss: 0.2815 - val\_acc: 0.9238

Confusion matrix, without normalization

[[196 14]

[ 10 200]]

Network\_128\_256\_2

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Layer (type) Output Shape Param #

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dense\_7 (Dense) (None, 128) 256

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dense\_8 (Dense) (None, 256) 33024

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dense\_9 (Dense) (None, 2) 514

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Total params: 33,794

Trainable params: 33,794

Non-trainable params: 0

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Train on 1890 samples, validate on 210 samples

Epoch 1/30

- 1s - loss: 0.6502 - acc: 0.5524 - val\_loss: 0.6011 - val\_acc: 0.6714

Epoch 2/30

- 0s - loss: 0.5529 - acc: 0.7339 - val\_loss: 0.5175 - val\_acc: 0.8000

Epoch 3/30

- 0s - loss: 0.4490 - acc: 0.8508 - val\_loss: 0.4383 - val\_acc: 0.8381

Epoch 4/30

- 0s - loss: 0.3595 - acc: 0.9053 - val\_loss: 0.3905 - val\_acc: 0.8476

Epoch 5/30

- 0s - loss: 0.3057 - acc: 0.9249 - val\_loss: 0.3673 - val\_acc: 0.8619

Epoch 6/30

- 0s - loss: 0.2781 - acc: 0.9333 - val\_loss: 0.3568 - val\_acc: 0.9190

Epoch 7/30

- 0s - loss: 0.2633 - acc: 0.9392 - val\_loss: 0.3517 - val\_acc: 0.9190

Epoch 8/30

- 0s - loss: 0.2549 - acc: 0.9413 - val\_loss: 0.3527 - val\_acc: 0.8952

Epoch 9/30

- 0s - loss: 0.2499 - acc: 0.9407 - val\_loss: 0.3481 - val\_acc: 0.8952

Epoch 10/30

- 0s - loss: 0.2448 - acc: 0.9397 - val\_loss: 0.3458 - val\_acc: 0.8952

Epoch 11/30

- 0s - loss: 0.2406 - acc: 0.9439 - val\_loss: 0.3435 - val\_acc: 0.9190

Epoch 12/30

- 0s - loss: 0.2379 - acc: 0.9434 - val\_loss: 0.3410 - val\_acc: 0.9190

Epoch 13/30

- 0s - loss: 0.2353 - acc: 0.9439 - val\_loss: 0.3503 - val\_acc: 0.8952

Epoch 14/30

- 0s - loss: 0.2335 - acc: 0.9460 - val\_loss: 0.3455 - val\_acc: 0.8952

Epoch 15/30

- 0s - loss: 0.2307 - acc: 0.9460 - val\_loss: 0.3370 - val\_acc: 0.9286

Epoch 16/30

- 0s - loss: 0.2296 - acc: 0.9471 - val\_loss: 0.3380 - val\_acc: 0.9286

Epoch 17/30

- 0s - loss: 0.2282 - acc: 0.9487 - val\_loss: 0.3384 - val\_acc: 0.9190

Epoch 18/30

- 0s - loss: 0.2269 - acc: 0.9476 - val\_loss: 0.3352 - val\_acc: 0.9286

Epoch 19/30

- 0s - loss: 0.2257 - acc: 0.9476 - val\_loss: 0.3436 - val\_acc: 0.9190

Epoch 20/30

- 0s - loss: 0.2248 - acc: 0.9460 - val\_loss: 0.3404 - val\_acc: 0.9190

Epoch 21/30

- 0s - loss: 0.2239 - acc: 0.9497 - val\_loss: 0.3525 - val\_acc: 0.8952

Epoch 22/30

- 0s - loss: 0.2235 - acc: 0.9481 - val\_loss: 0.3407 - val\_acc: 0.9190

Epoch 23/30

- 0s - loss: 0.2226 - acc: 0.9487 - val\_loss: 0.3424 - val\_acc: 0.9190

Epoch 24/30

- 0s - loss: 0.2218 - acc: 0.9476 - val\_loss: 0.3451 - val\_acc: 0.9190

Epoch 25/30

- 0s - loss: 0.2217 - acc: 0.9476 - val\_loss: 0.3381 - val\_acc: 0.9286

Epoch 26/30

- 0s - loss: 0.2204 - acc: 0.9534 - val\_loss: 0.3476 - val\_acc: 0.9190

Epoch 27/30

- 0s - loss: 0.2196 - acc: 0.9471 - val\_loss: 0.3386 - val\_acc: 0.9286

Epoch 28/30

- 0s - loss: 0.2198 - acc: 0.9497 - val\_loss: 0.3397 - val\_acc: 0.9286

Epoch 29/30

- 0s - loss: 0.2193 - acc: 0.9513 - val\_loss: 0.3438 - val\_acc: 0.9190

Epoch 30/30

- 0s - loss: 0.2192 - acc: 0.9471 - val\_loss: 0.3414 - val\_acc: 0.9190

Confusion matrix, without normalization

[[198 12]

[ 10 200]]

Network\_256\_512\_2

Layer (type) Output Shape Param #

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dense\_10 (Dense) (None, 256) 512

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dense\_11 (Dense) (None, 512) 131584

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dense\_12 (Dense) (None, 2) 1026

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Total params: 133,122

Trainable params: 133,122

Non-trainable params: 0

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Train on 1890 samples, validate on 210 samples

Epoch 1/30

- 1s - loss: 0.6005 - acc: 0.6413 - val\_loss: 0.4906 - val\_acc: 0.8143

Epoch 2/30

- 1s - loss: 0.4416 - acc: 0.8481 - val\_loss: 0.3161 - val\_acc: 0.9095

Epoch 3/30

- 1s - loss: 0.3242 - acc: 0.9143 - val\_loss: 0.2356 - val\_acc: 0.9286

Epoch 4/30

- 1s - loss: 0.2848 - acc: 0.9312 - val\_loss: 0.2106 - val\_acc: 0.9429

Epoch 5/30

- 1s - loss: 0.2698 - acc: 0.9402 - val\_loss: 0.1987 - val\_acc: 0.9286

Epoch 6/30

- 1s - loss: 0.2621 - acc: 0.9418 - val\_loss: 0.1947 - val\_acc: 0.9286

Epoch 7/30

- 1s - loss: 0.2576 - acc: 0.9418 - val\_loss: 0.1887 - val\_acc: 0.9429

Epoch 8/30

- 1s - loss: 0.2538 - acc: 0.9386 - val\_loss: 0.1851 - val\_acc: 0.9524

Epoch 9/30

- 1s - loss: 0.2507 - acc: 0.9434 - val\_loss: 0.1840 - val\_acc: 0.9667

Epoch 10/30

- 1s - loss: 0.2489 - acc: 0.9402 - val\_loss: 0.1819 - val\_acc: 0.9524

Epoch 11/30

- 1s - loss: 0.2474 - acc: 0.9407 - val\_loss: 0.1826 - val\_acc: 0.9667

Epoch 12/30

- 1s - loss: 0.2459 - acc: 0.9444 - val\_loss: 0.1776 - val\_acc: 0.9667

Epoch 13/30

- 1s - loss: 0.2446 - acc: 0.9455 - val\_loss: 0.1760 - val\_acc: 0.9524

Epoch 14/30

- 1s - loss: 0.2440 - acc: 0.9423 - val\_loss: 0.1743 - val\_acc: 0.9524

Epoch 15/30

- 1s - loss: 0.2431 - acc: 0.9444 - val\_loss: 0.1735 - val\_acc: 0.9524

Epoch 16/30

- 1s - loss: 0.2419 - acc: 0.9466 - val\_loss: 0.1726 - val\_acc: 0.9667

Epoch 17/30

- 1s - loss: 0.2410 - acc: 0.9481 - val\_loss: 0.1730 - val\_acc: 0.9667

Epoch 18/30

- 0s - loss: 0.2406 - acc: 0.9413 - val\_loss: 0.1727 - val\_acc: 0.9667

Epoch 19/30

- 0s - loss: 0.2394 - acc: 0.9466 - val\_loss: 0.1706 - val\_acc: 0.9667

Epoch 20/30

- 0s - loss: 0.2393 - acc: 0.9439 - val\_loss: 0.1694 - val\_acc: 0.9667

Epoch 21/30

- 0s - loss: 0.2385 - acc: 0.9460 - val\_loss: 0.1688 - val\_acc: 0.9524

Epoch 22/30

- 0s - loss: 0.2376 - acc: 0.9455 - val\_loss: 0.1692 - val\_acc: 0.9667

Epoch 23/30

- 0s - loss: 0.2370 - acc: 0.9439 - val\_loss: 0.1691 - val\_acc: 0.9667

Epoch 24/30

- 0s - loss: 0.2368 - acc: 0.9455 - val\_loss: 0.1681 - val\_acc: 0.9667

Epoch 25/30

- 0s - loss: 0.2358 - acc: 0.9455 - val\_loss: 0.1678 - val\_acc: 0.9667

Epoch 26/30

- 0s - loss: 0.2352 - acc: 0.9476 - val\_loss: 0.1662 - val\_acc: 0.9667

Epoch 27/30

- 0s - loss: 0.2340 - acc: 0.9481 - val\_loss: 0.1697 - val\_acc: 0.9524

Epoch 28/30

- 0s - loss: 0.2335 - acc: 0.9466 - val\_loss: 0.1661 - val\_acc: 0.9667

Epoch 29/30

- 0s - loss: 0.2340 - acc: 0.9450 - val\_loss: 0.1652 - val\_acc: 0.9667

Epoch 30/30

- 0s - loss: 0.2325 - acc: 0.9439 - val\_loss: 0.1653 - val\_acc: 0.9524

Confusion matrix, without normalization

[[193 17]

[ 9 201]]