

Students: Nadav Spitzer, 302228275. Lior Frenkel, 204728315

Part 4

NER task – With pretrained embeddings

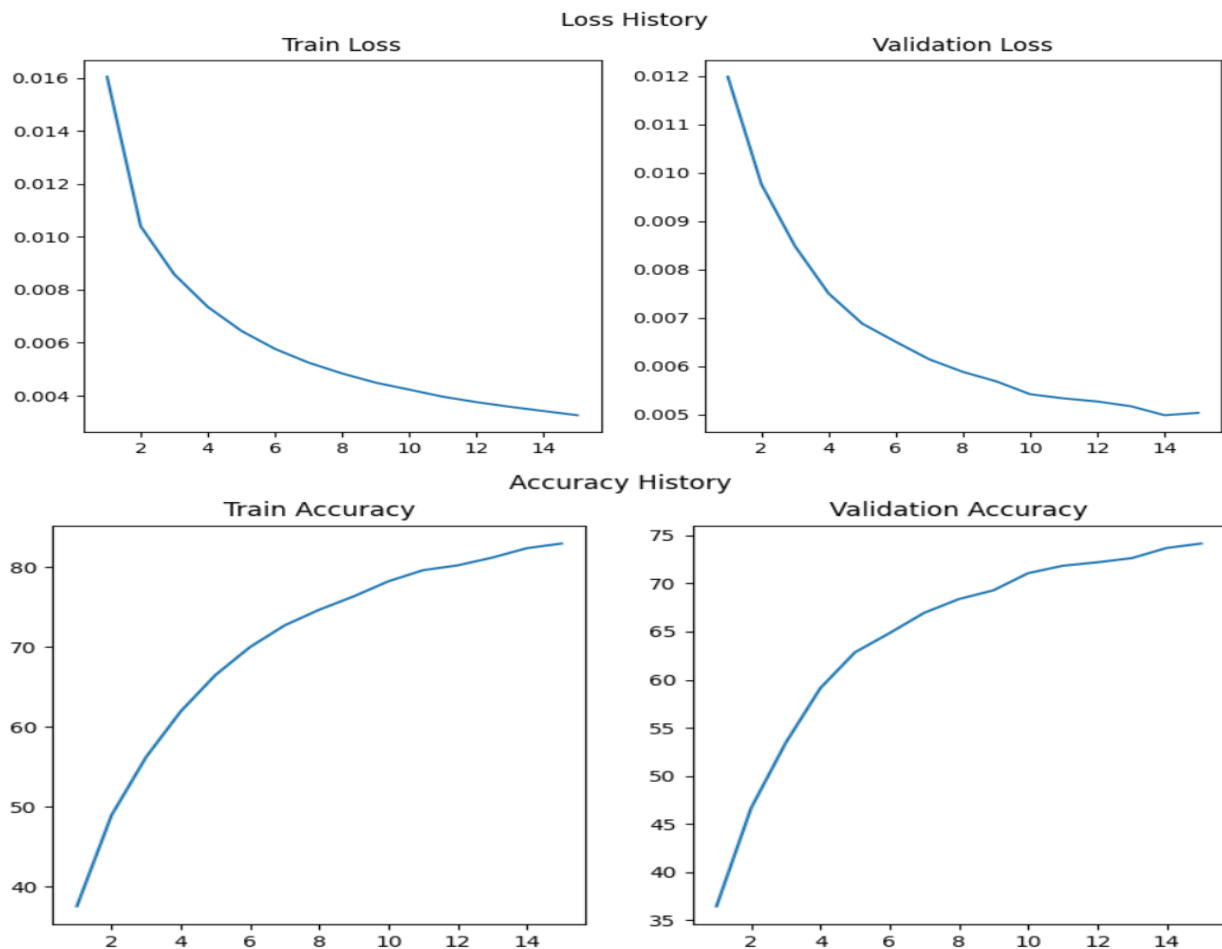
1. Parameters:

- a. Number of epochs: 15
- b. Learning rate: $1e-4$
- c. Batch size: 32
- d. Hidden layer size: 150
- e. Optimizer: Adam
- f. Dropout with 0.5 probability

2. Results:

- a. Train loss: 0.003263
- b. Train accuracy: 82.915%
- c. Validation loss: 0.005039
- d. Validation accuracy: 74.15%

3. Graphs:



NER task – Without pretrained embeddings

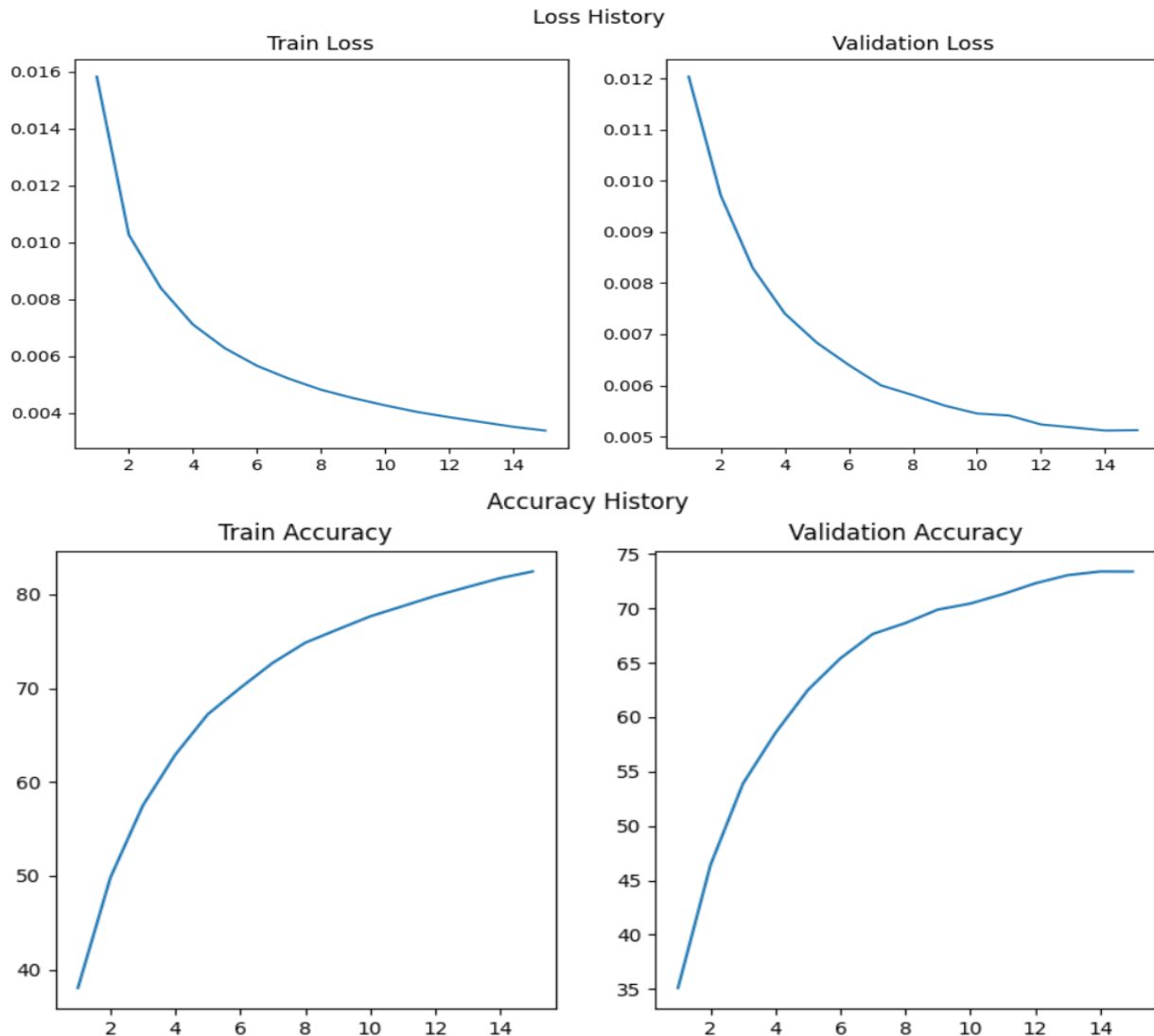
1. Parameters:

- Number of epochs: 15
- Learning rate: $1e-4$
- Batch size: 32
- Hidden layer size: 150
- Optimizer: Adam
- Dropout with 0.5 probability

2. Results:

- Train loss: 0.003381
- Train accuracy: 82.444%
- Validation loss: 0.005124
- Validation accuracy: 73.388%

3. Graphs:



POS task – With pretrained embeddings

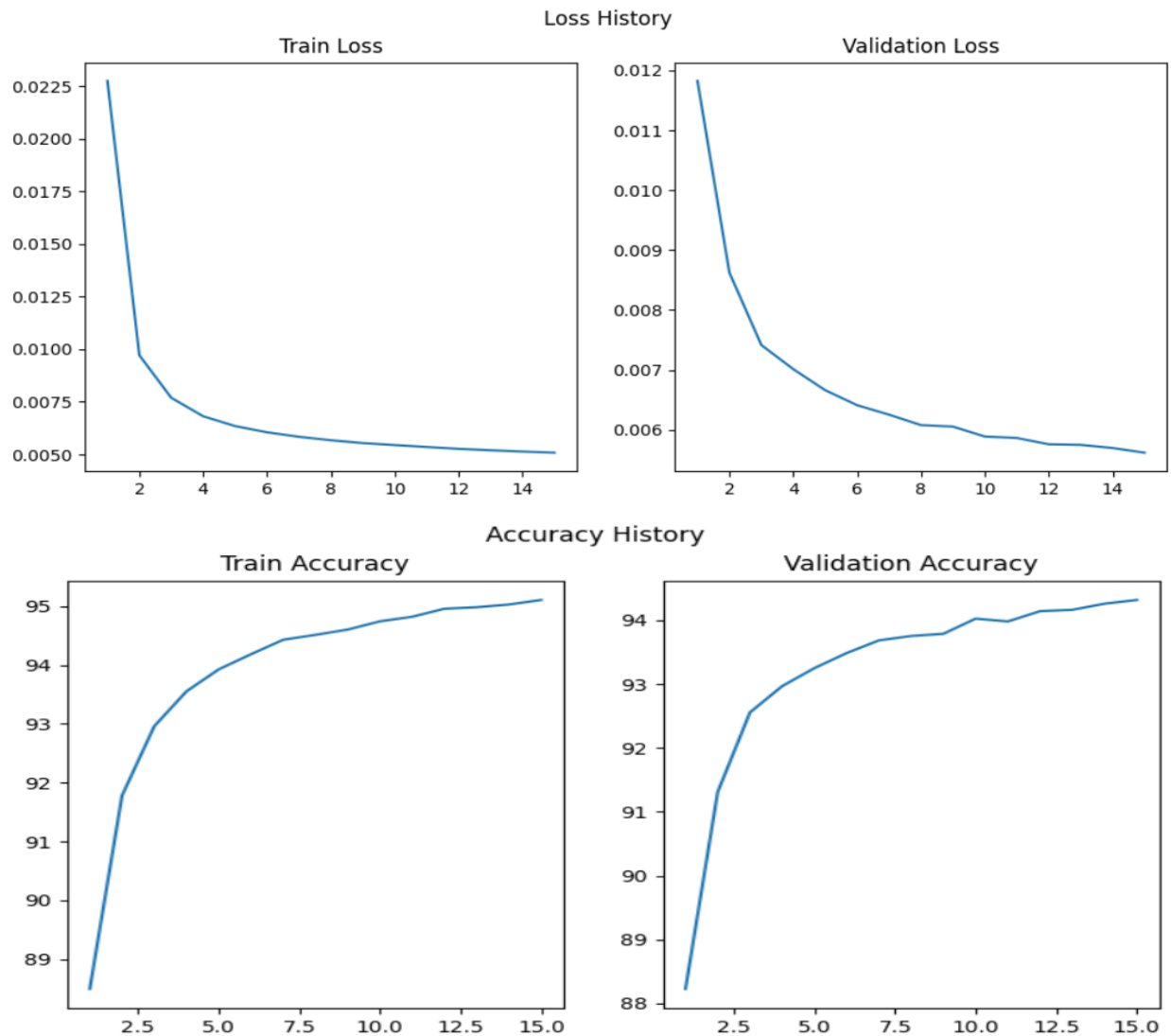
1. Parameters:

- Number of epochs: 15
- Learning rate: $1e-4$
- Batch size: 32
- Hidden layer size: 150
- Optimizer: Adam
- Dropout with 0.5 probability

2. Results:

- Train loss: 0.00508
- Train accuracy: 95.105%
- Validation loss: 0.0056168
- Validation accuracy: 94.318%

3. Graphs:



POS task – Without pretrained embeddings

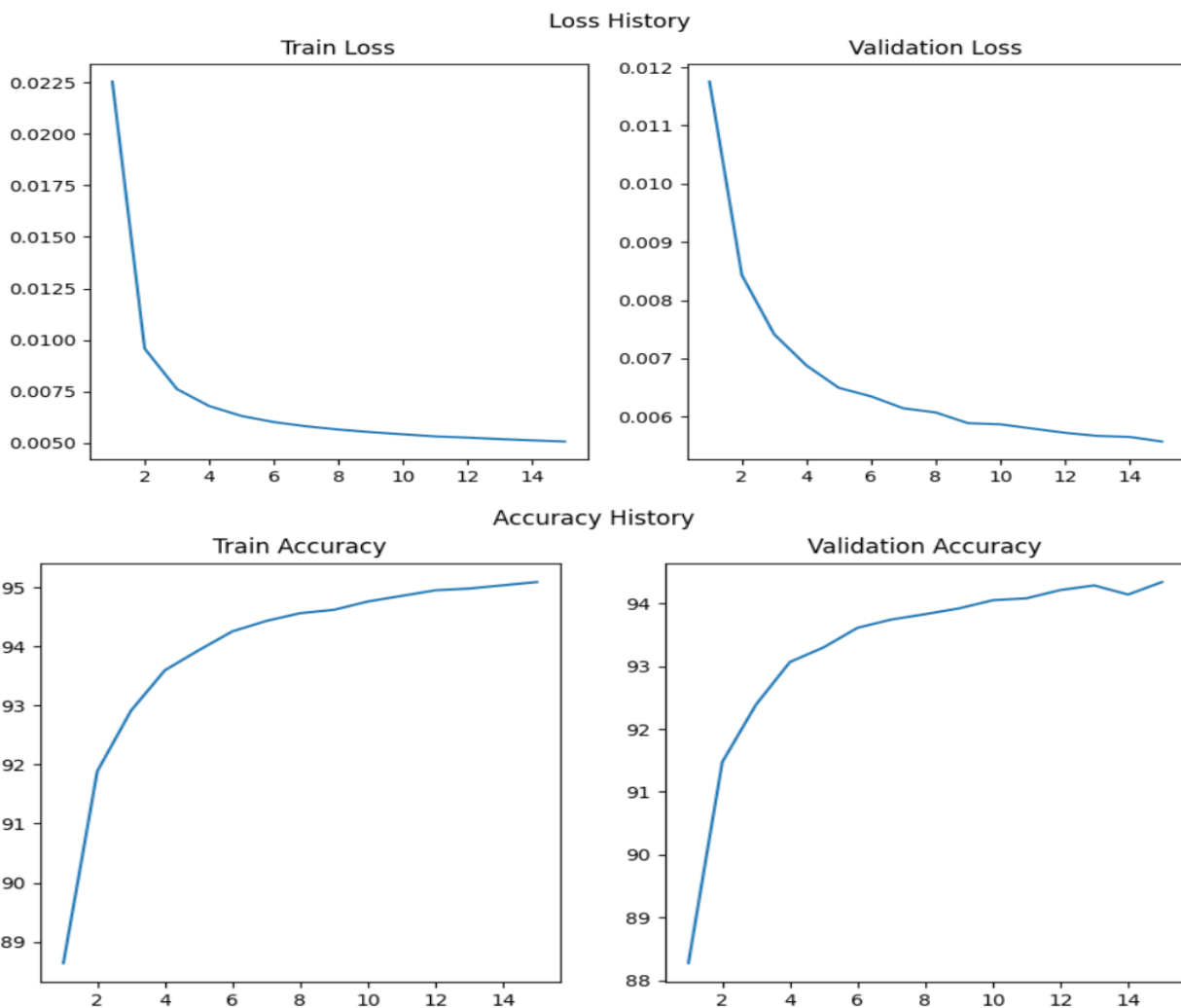
1. Parameters:

- Number of epochs: 15
- Learning rate: $1e-4$
- Batch size: 32
- Hidden layer size: 150
- Optimizer: Adam
- Dropout with 0.5 probability

2. Results:

- Train loss: 0.00508
- Train accuracy: 95.094%
- Validation loss: 0.005576
- Validation accuracy: 94.341%

3. Graphs:



In this task we also used special words for the start of a sentence ('<S>'), the end of the sentence ('<E>') and unknown words ('UUUKNNN'). We padded the start and end of each sentence with those words and replaced any unknown word with the 'UUUKNNN' word. Doing this helped us when encountering words that appear in the DEV set but not in the TRAIN set.

25 Most common words:

'the', 'of', 'to', 'a', 'in', 'and', 's', 'that', 'for', 'is', 'it', 'said', 'on', 'at', 'by', 'as', 'from', 'million', 'with', 'mr.', 'was', 'be', 'are', 'its', 'he'.

25 Most common prefixes:

'con', 'pro', 'dis', 'pre', 'com', 'mar', 'int', 'cha', 'sta', 'car', 'tra', 'for', 'par', 'str', 'man', 'sub', 'per', 'sha', 'gra', 'har', 'ant', 'bar', 'col', 'cor', 'mon'.

25 Most common suffixes:

'ing', 'ion', 'ers', 'ted', 'ons', 'ter', 'ies', 'ton', 'ate', 'ent', 'man', 'ian', 'ble', 'ine', 'red', 'ity', 'ess', 'tes', 'lly', 'sed', 'ive', 'tic', 'ist', 'les', 'son'.

These words and sub-words help us determine the context of each word (mostly verbs with the 'ing' suffix, nouns with the 'sub' prefix etc...).

These sub-words are also consistent across both tasks because they give us a lot of information about the context of the words.