Meeting — Summary LLM

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Updates

- Bias terms in encoder and decoder
- More nodes in hidden layer speeds up convergence
- Also tried out 3 nodes, results are "more noisy". However, could be interesting when claims have more "dimensions" behind them.
- Threshold: Each log-likelihood below 1 (this is softer than)

Relevant Code

```
while not bStop:
    aStore = np.zeros((1, tOHETarget.shape[0]))
    lLoss = []
    for i in range(tOHETarget.shape[0]):
        ae_outputs = ae(tOHETarget[i, :])
        outputs = lGenerate[i](ae_outputs.reshape(1, 1, -1))
        loss = llikelihood(outputs, lTargetSequence[i])

        optimizer.zero_grad()
        loss.backward()
        optimizer.step()
    bStop = np.all(aLLHistory[epoch, :] < dEps)
```
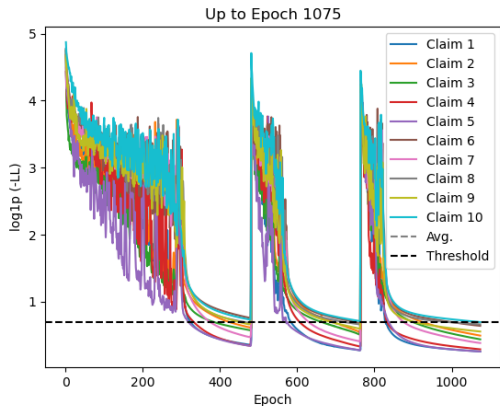
Figure 1: 4:15h MacBook, Hair, 10 Claims, ADAM lr=3

EPOCH 2775: [0.76314783 0.55048442 0.99498904 0.57423663 0.59492874 0.93118715
0.97762257 0.35627443 0.8827939 0.87887418], joint: 7.504538893699646, time: 186.0 s
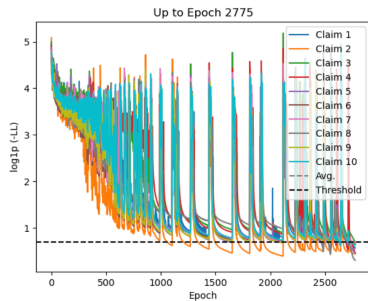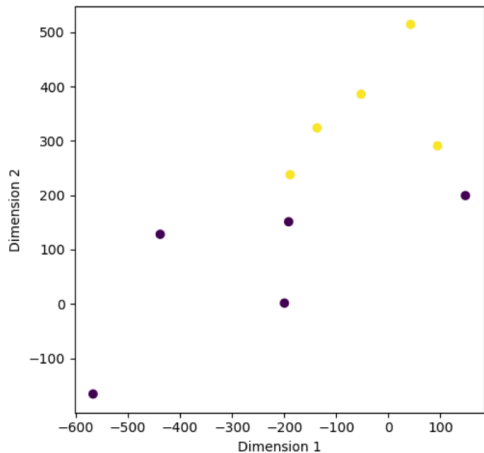

Figure 2: 14h MacBook, Cleaner, 10 Claims, ADAM lr=3
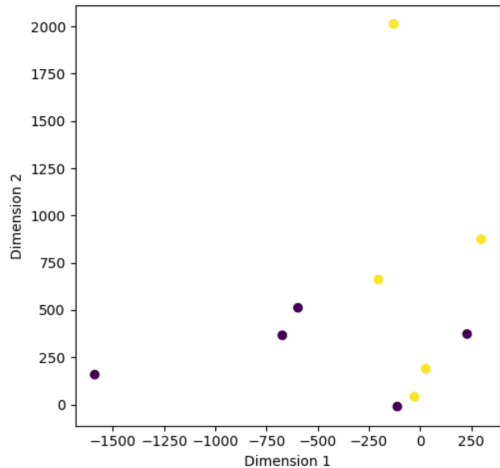
Figure 3: Autoencoder values of Hair 2 dimensions
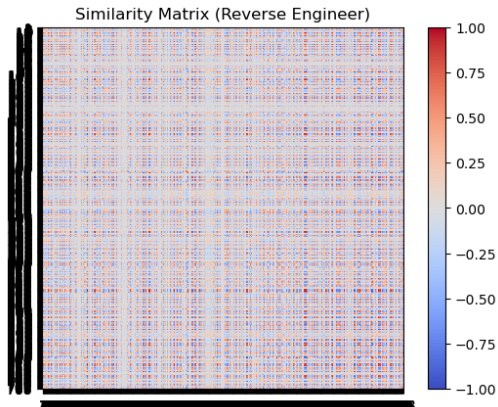

Figure 4: Autoencoder values of Cleaner 2 dimensions
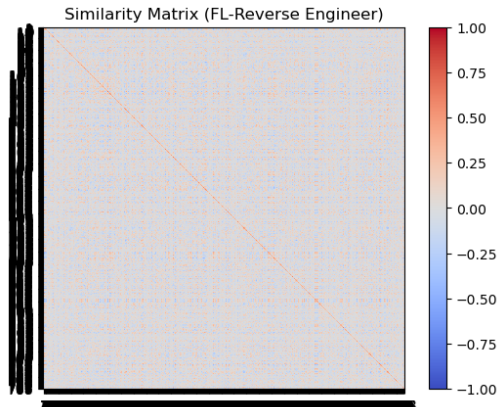
Figure 5: Embeddings AE-2D

Figure 6: Embeddings Previously

Hair

```
"Experience mirror-like shine with every wash.",
"Get dazzling, glossy hair in just one use.",
"Transform dull strands into radiant locks.",
"Achieve salon-quality shine at home.",
"Enhance natural brilliance with our advanced formula.",
"Unlock the confidence of luminous hair that turns heads.",
"Experience the joy of hair that gleams with vitality.",
"Embrace the radiance of hair that reflects your inner beauty.",
"Elevate your everyday with hair that shines with sophistication.",
"Feel the allure of irresistibly shiny hair that captivates."
```
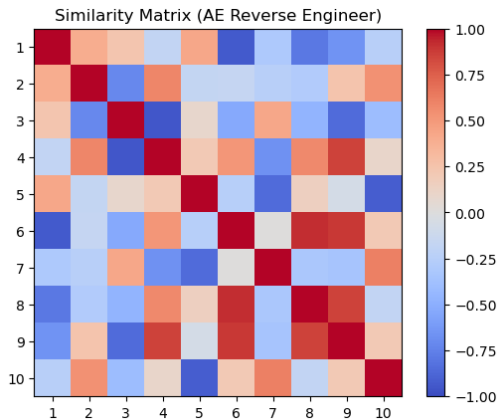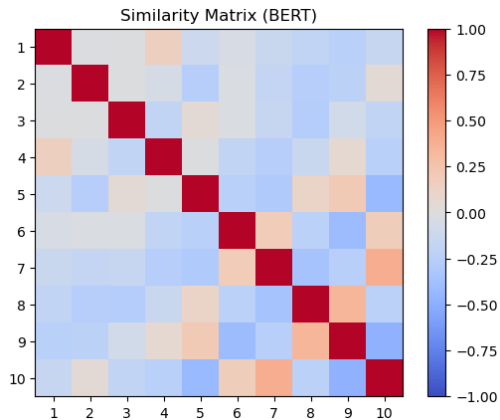
Figure 7: Corr. Mat. 3D-AE Hair

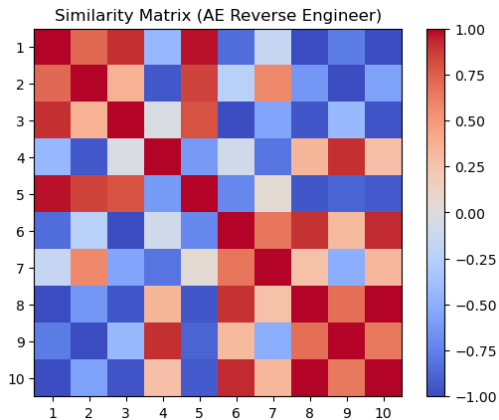**Figure 8:** Corr. Mat. BERT Hair
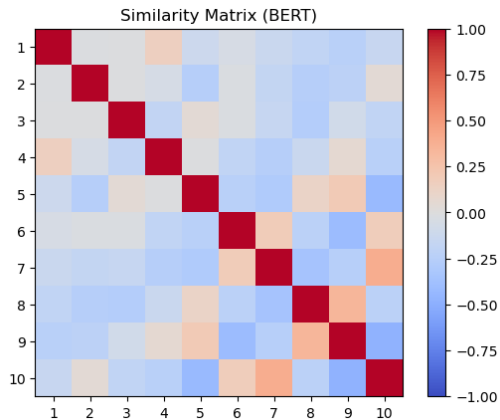
Figure 9: Corr. Mat. 2D-AE Hair

Figure 10: Corr. Mat. BERT Hair

Surface Cleaner

```
"Our surface cleaner delivers a mirror-like shine every time.",
"Say goodbye to streaks and smudges with our powerful formula.",
"Achieve a noticeable sparkle on all surfaces with just one application
"Experience surfaces so clean, you can see your reflection in them.",
"Our cleaner leaves behind a gleaming, polished finish that lasts.",
"Elevate your surroundings with a touch of brilliance.",
"Unleash the hidden beauty of your home with our surface cleaner.",
"Experience the joy of pristine surfaces that brighten your space.",
"Bring a sense of clarity and freshness to your environment.",
"Enhance the ambiance of any room with surfaces that radiate."
```
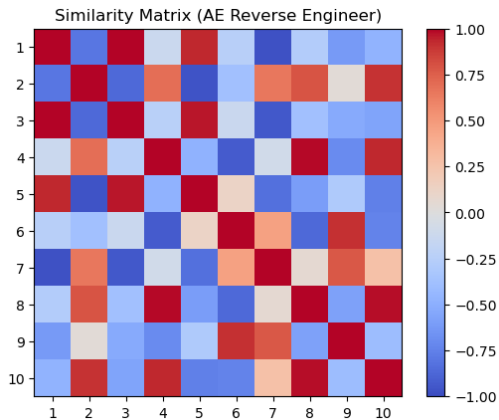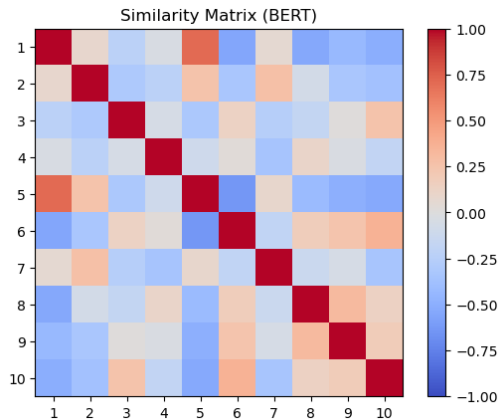
Figure 11: Corr. Mat. 2D-AE Cleaner
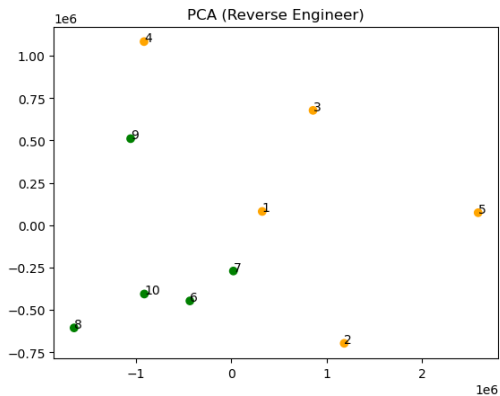

Figure 12: Corr. Mat. BERT Cleaner
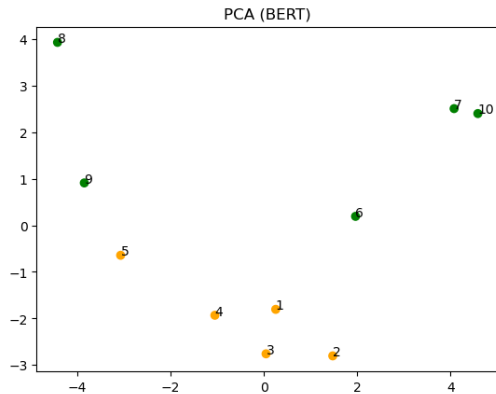
Figure 13: PCA 2D-AE Hair
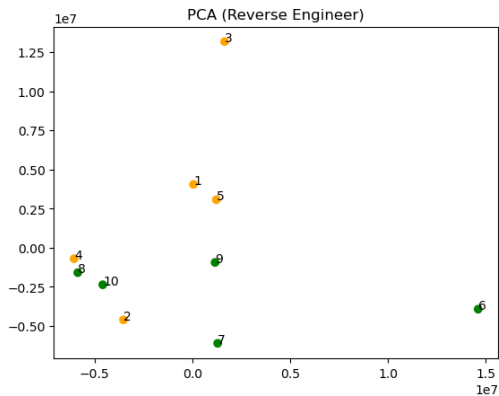

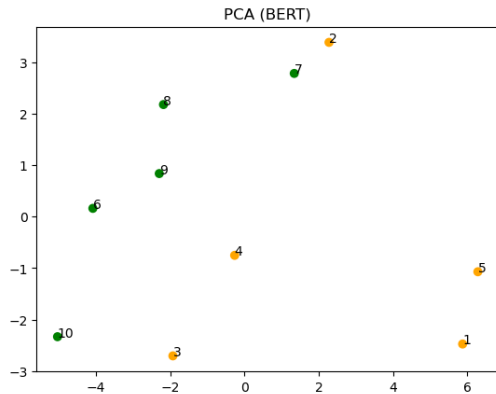**Figure 14:** PCA BERT Hair

Figure 15: PCA 2D-AE Cleaner
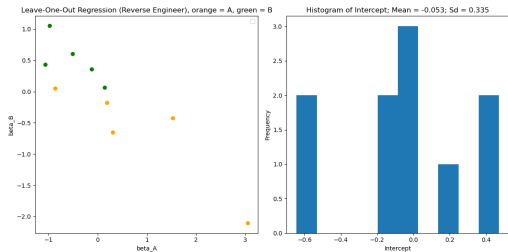
Figure 16: PCA BERT Cleaner
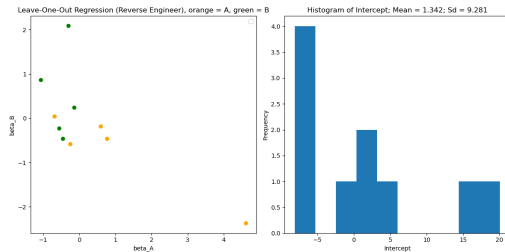
Figure 17: LOO 2D-AE Hair

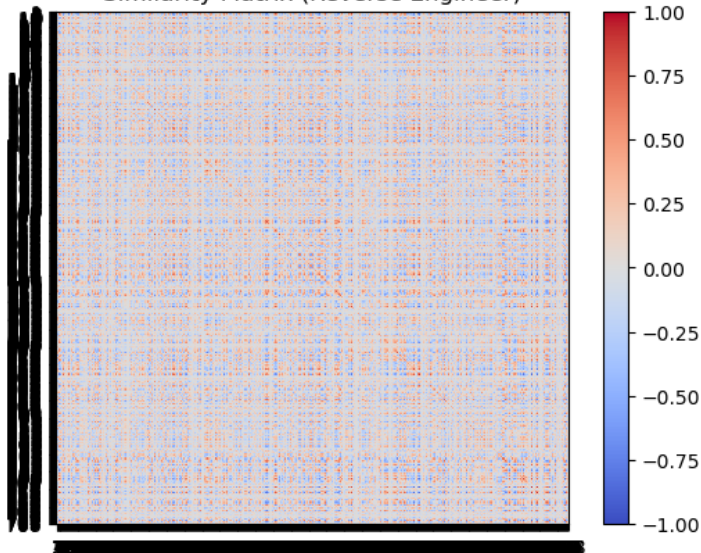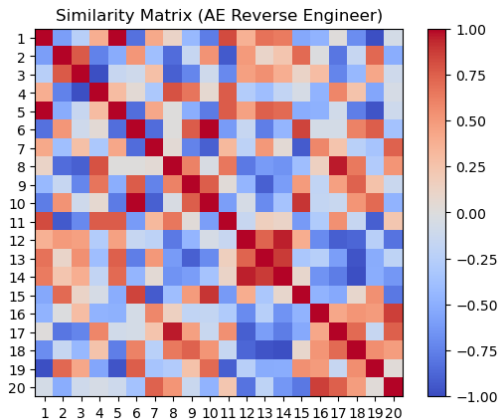**Figure 18:** LOO 2D-AE Cleaner
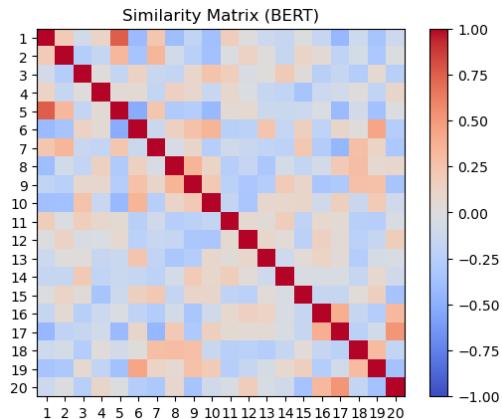
Figure 19: Embeddings AE-3D

Figure 20: Corr. Mat. BERT Hair

Figure 21: Corr. Mat. BERT Hair