Why is emoji prediction difficult?

TAR project

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This song is lit!

This song is lit! 🔥

This song is lit! 🔥

And to all, a Merry Christmas!

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

I need new friends...

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

I need new friends... 😔

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

I need new friends... 😔 😂

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

I need new friends... 😔 😂

I'm so happy to have you

This song is lit! 🔥

And to all, a Merry Christmas! 🎄

I need new friends... 😔 😂

I'm so happy to have you ❤️ 💕 💙 💜 😍

Dataset

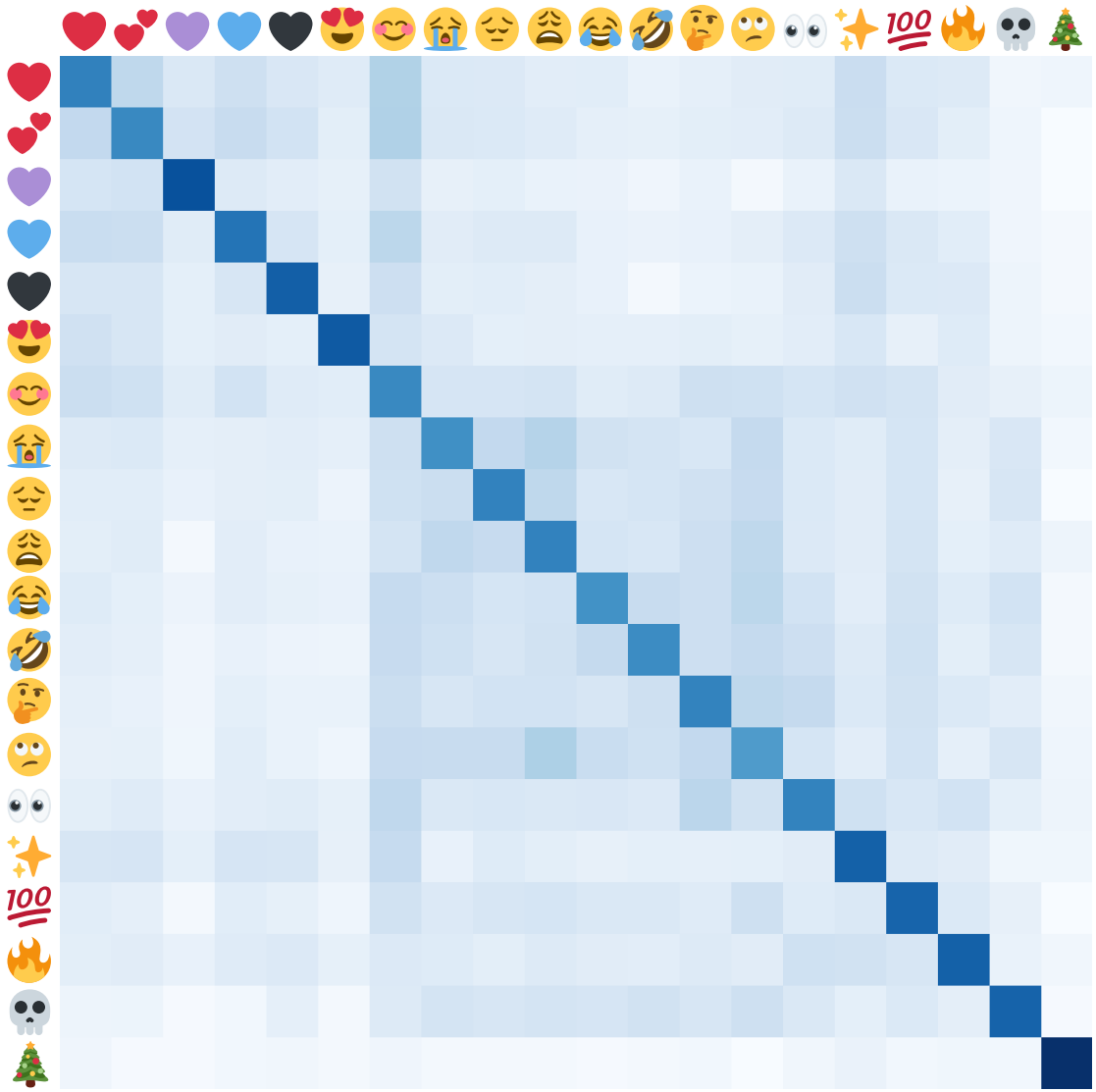
- 10 million tweets collected
- Only tweets with single emoji kept
- Final data: 200 000 tweets ($20 \times 10\,000$)
- Train: 120 000, validation: 40 000, test: 40 000 (all balanced)
- Tweet text $\mapsto$ emoji

Experiment 1

- We compare various models:
  - Naïve Bayes (NB)
  - Logistic regression (LR)
  - Feed forward neural network (NN)
  - Bidirectional LSTM (BLSTM)
- GloVe vs TF-IDF
- Word order
- Naïve assumption

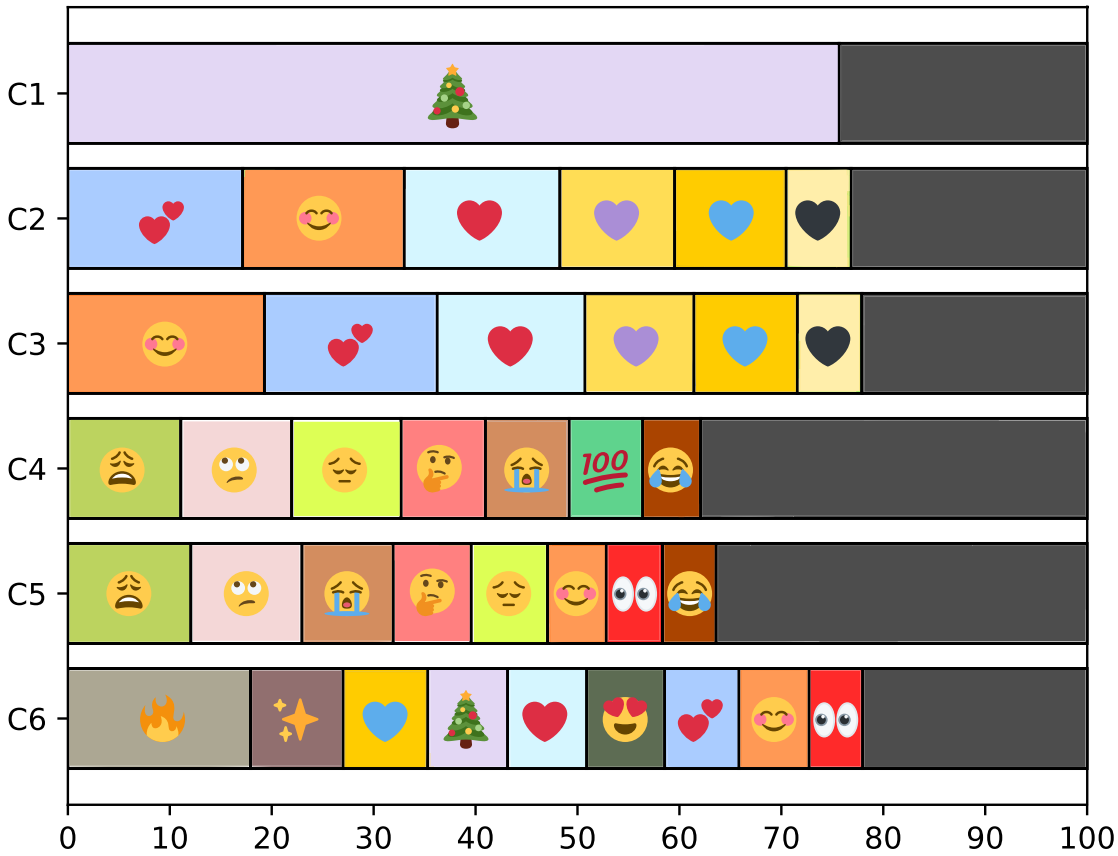
Model	Accuracy (%)
NB	51.15
LR GloVe	33.78
LR TF-IDF	53.35
NN GloVe	45.67
NN TF-IDF	51.05
BLSTM	51.40

Experiment 1



Experiment 2

- K-Means with GloVe (50 clusters)



Conclusion

- Main difficulties:
  - Synonymy among emojis
  - Subjective meanings
  - Sarcasm
- More information is needed for better performance