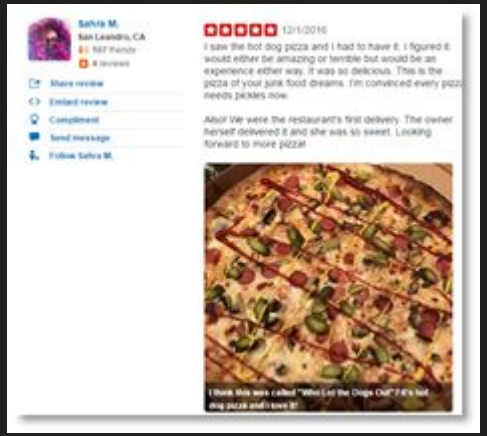
Yelp Text Review Rating Predictions

Yi, Ashley, Umber

Project Goals

- Apply NLP techniques to predict reviews star rating on yelp
- Building off of non NLP ML models
- Accuracy analysis



Background & Motivation

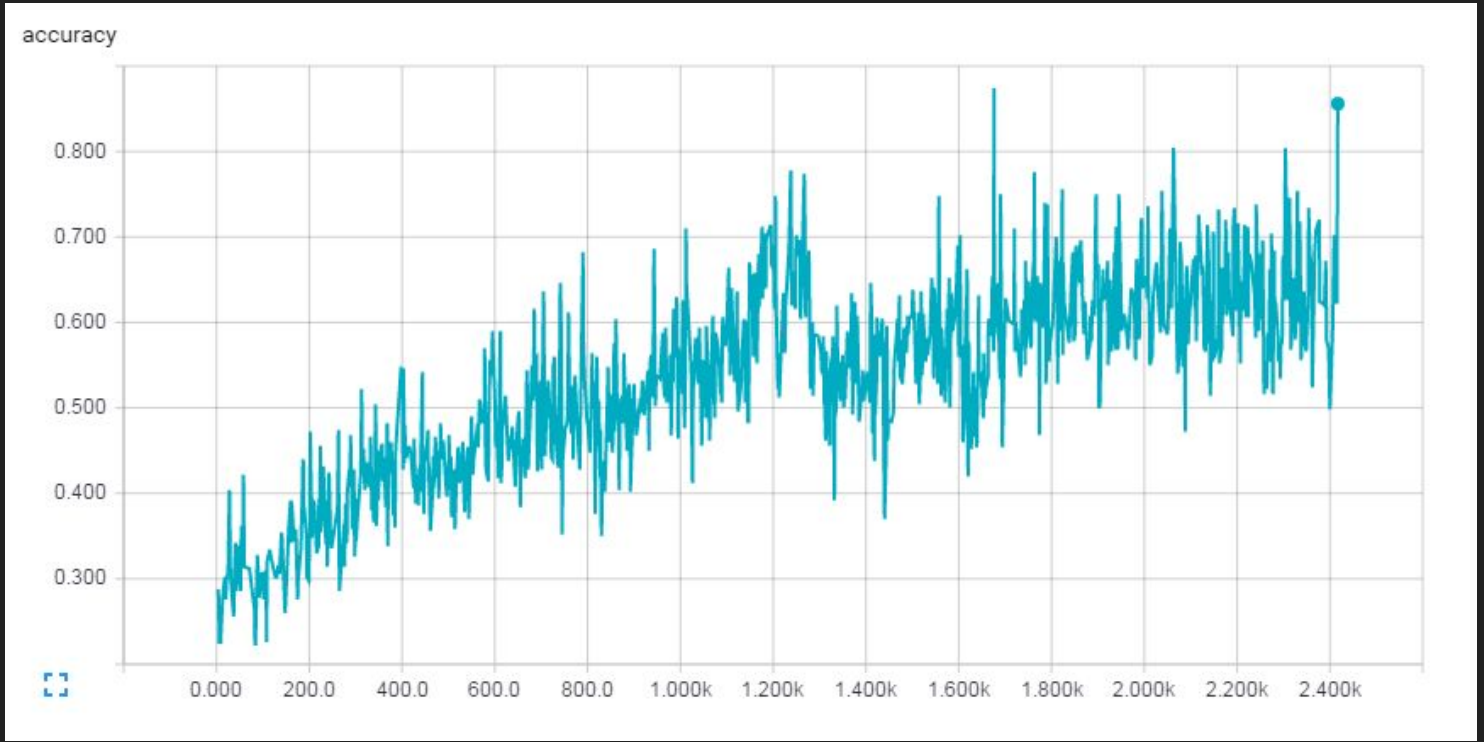
- Yelp dataset Challenge
  - 2.7 M reviews
  - 687 K users
  - 85 K businesses
- Analysis of words/methods to predict review stars

```
{
    'type': 'review',
    'business_id': (encrypted business id),
    'user_id': (encrypted user id),
    'stars': (star rating, rounded to half-stars),
    'text': (review text),
    'date': (date, formatted like '2012-03-14'),
    'votes': {(vote type): (count)},
}
```

Design & Implementation

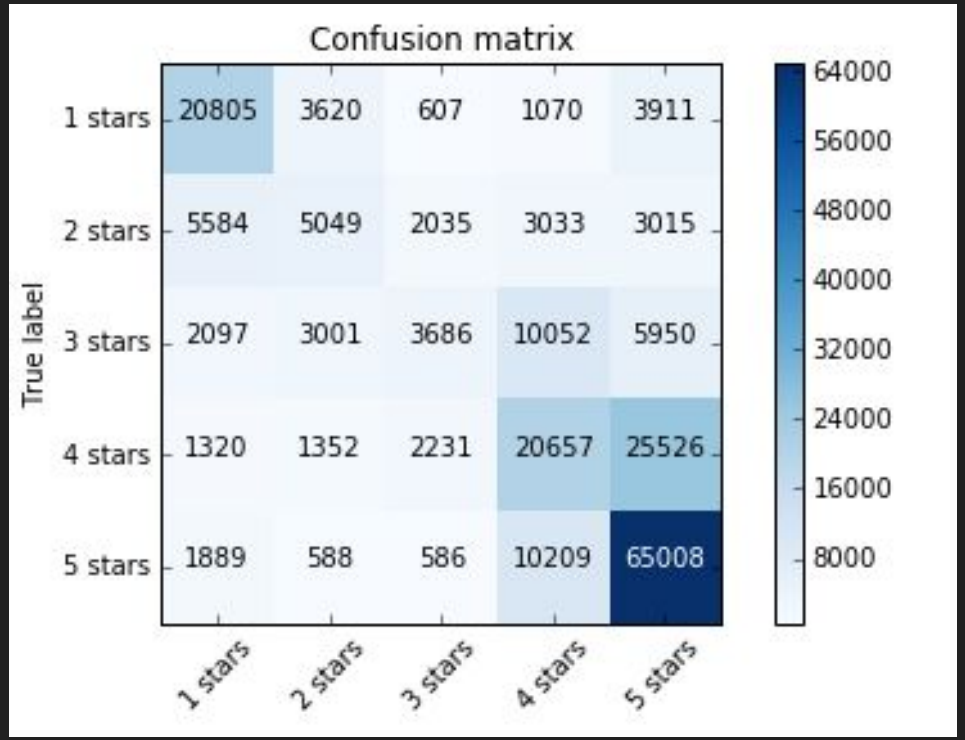
- Baseline
  - Bag of words, Multinomial Naive Bayes
- CNN
  - CNN focuses on word segments, automatic feature extraction
- Parameter tunings
  - Vocabulary size
  - Number of filters
  - Embedding size
  - Filter sizes
- Data pre-processing
- Dataset
  - Training: 1.7 M
  - Dev: 89 K
  - Test: 890 K

Results & Conclusions

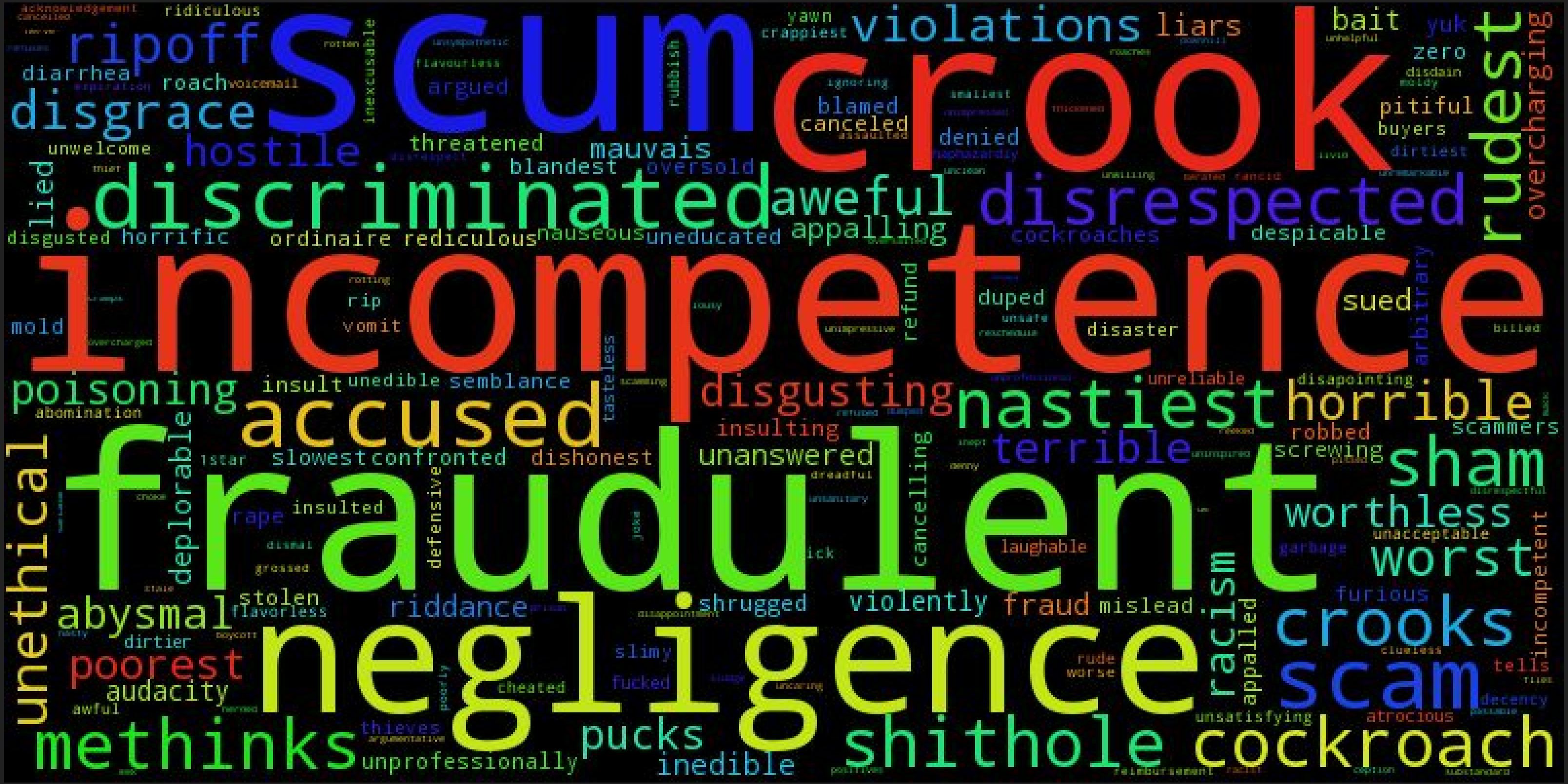


Accuracy in training (batch_size:500)

Results & Conclusions



Results on 200K test set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abysmal
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crooks
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unacceptable
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flavorless
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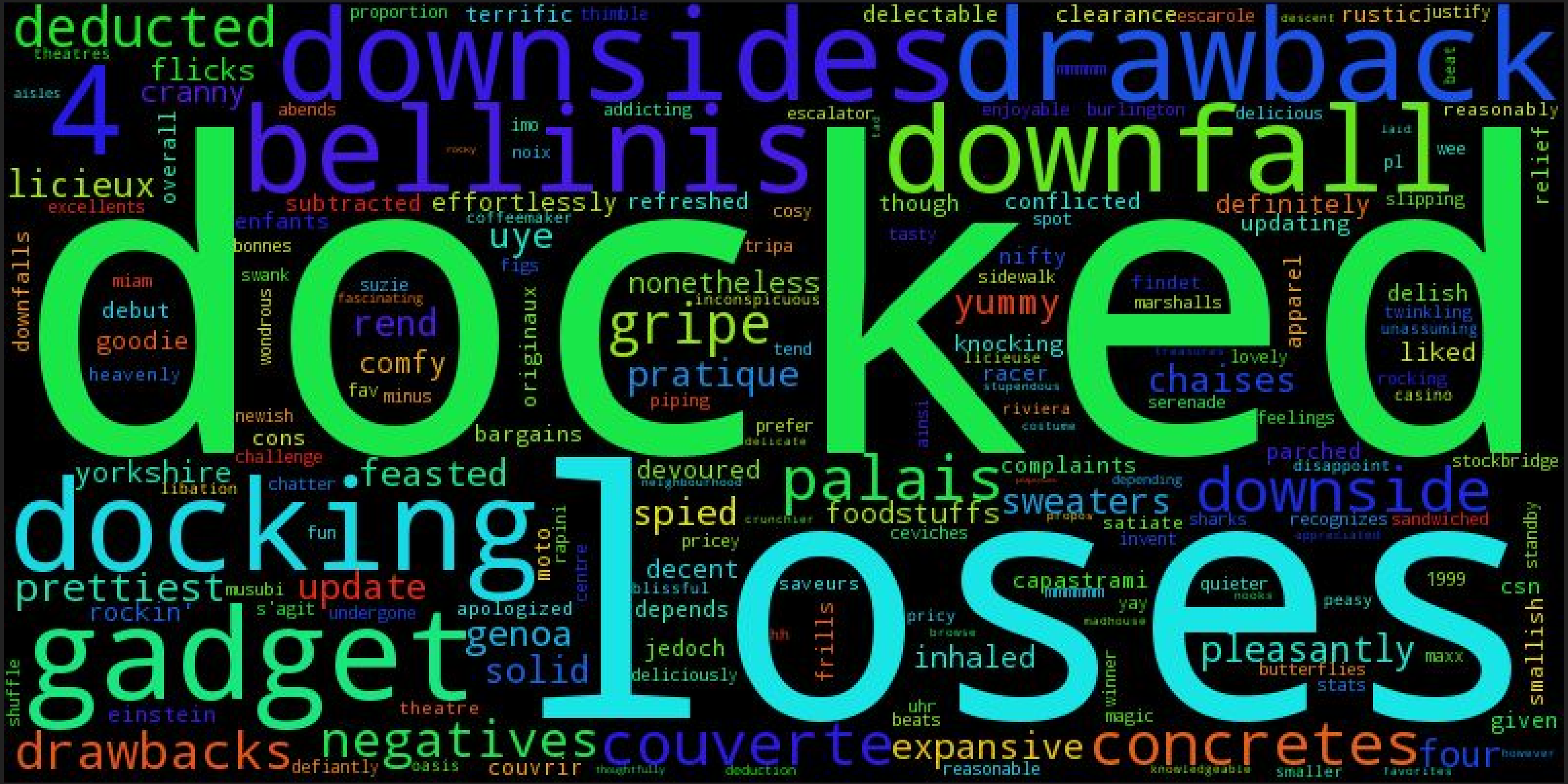
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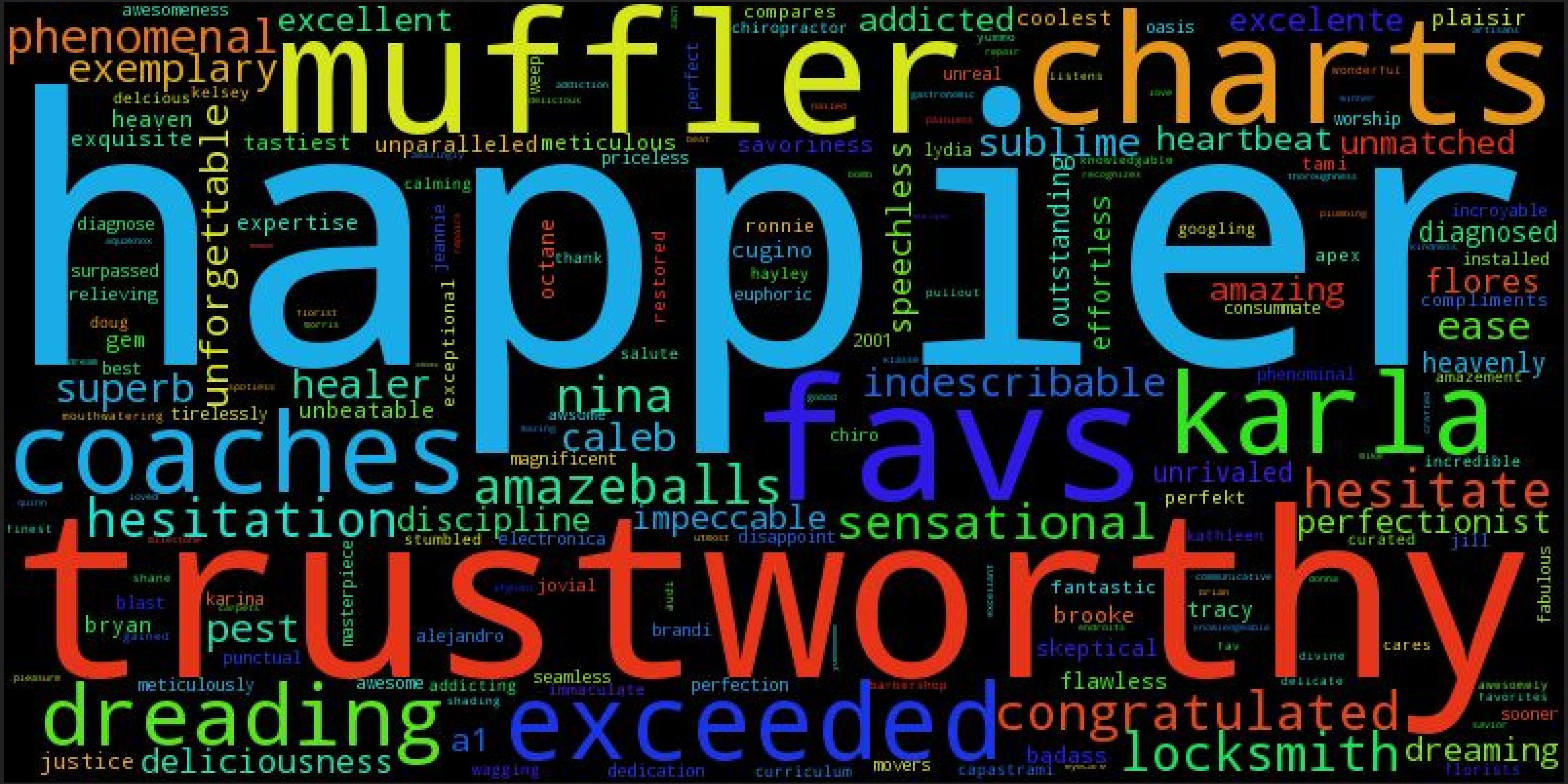
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exemplary
excellent
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caleb
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octane
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ronnie
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incredible
fabulous
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brandi
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awesome
addicting
seamless
immaculate
perfection
flawless
fantastic
brooke
tracy
skeptical
badass
movers
curriculum
dedication
wagging
capastrami
sooner
cares
divine
weep
perfect
unreal
listens
tami
calming
mouthwatering
shane

Resources & References

Github: https://github.com/ashley-dsci/266-Yelp

References:

- https://www.yelp.com/dataset_challenge
- http://cseweb.ucsd.edu/~jmcauley/cse255/reports/fa15/031.pdf
- http://cs229.stanford.edu/proj2014/Chen%20Li,%20Jin%20Zhang,%20Prediction%20of%20Yelp%20Review%20Star%20Rating%20using%20Sentiment%20Analysis.pdf