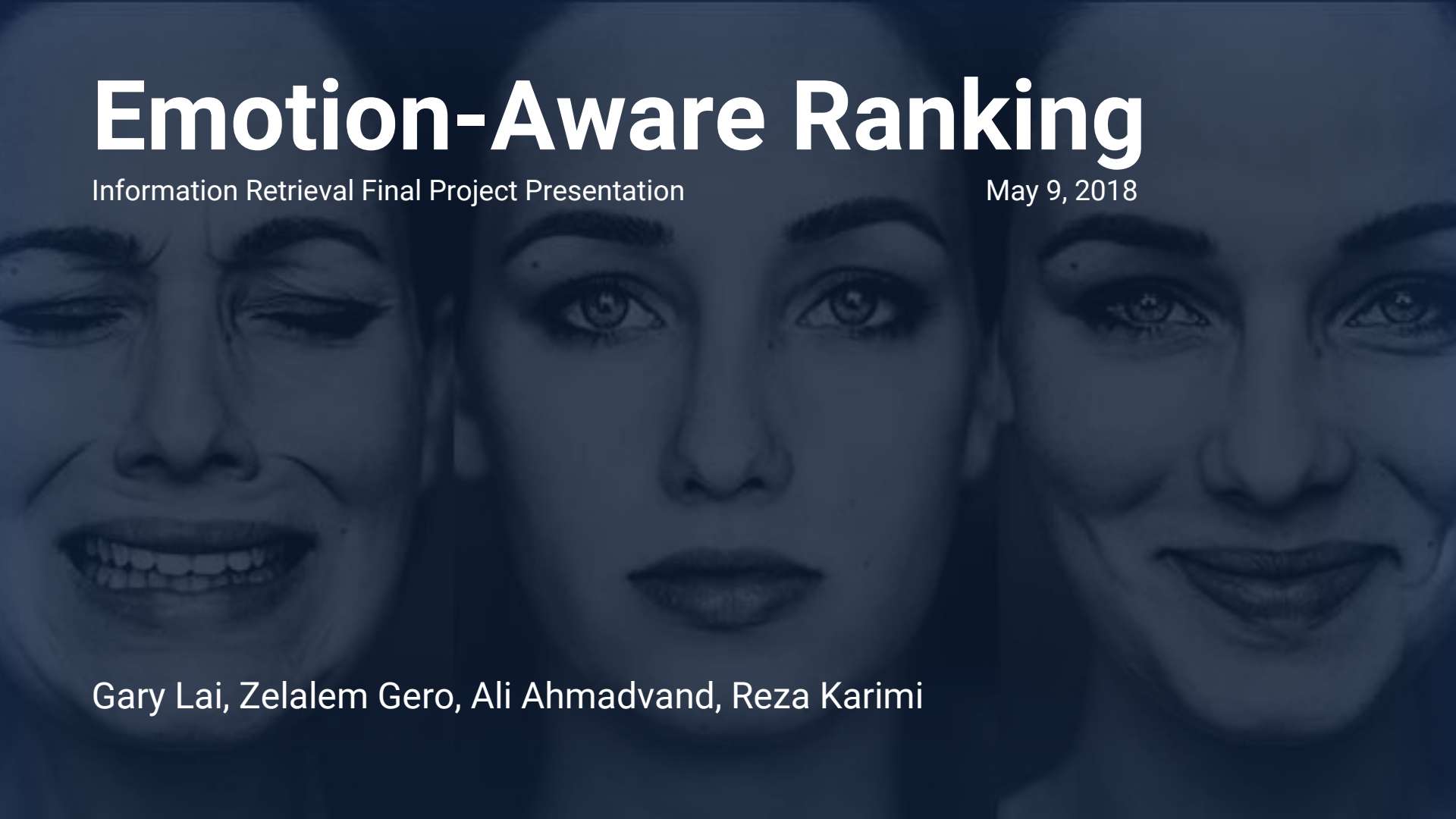
Emotion-Aware Ranking

Information Retrieval Final Project Presentation

May 9, 2018



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Motivation

To leverage the sentiment which traditional approaches may not catch

What we want vs. What we don't want

I missed my flight, that's great

Anger, Embarrassment, Sadness

Encouragement, Happiness

I finished my exam, I killed it

Power, Pride, Happiness, Achievement

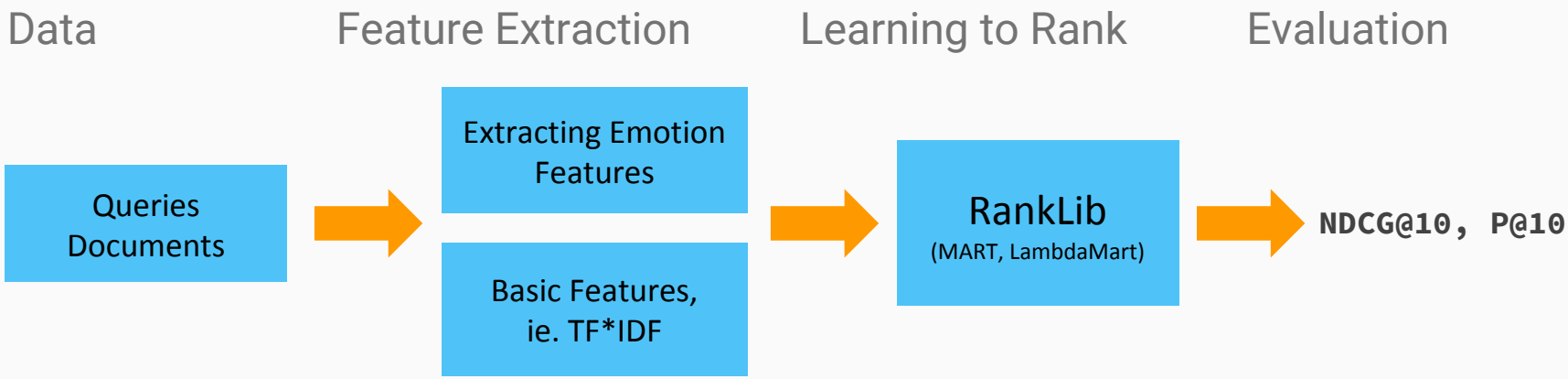
Gun, Evil, Fear, Death

I broke up with my girlfriend, how awesome is it?

Insecurity, Sadness

Pride, Happiness, Peace

Pipeline


Data
Feature Extraction
Learning to Rank
Evaluation
Queries
Documents
Extracting Emotion Features
Basic Features, ie. TF*IDF
RankLib
(MART, LambdaMart)
NDCG@10, P@10

Datasets

- **Emoji-labeled tweets**
  - 1.2 billion tweets (English, Text + Emoji)
- **Microblog TREC 2011**
  - 10 millions tweets
  - 50 queries
  - Each query has 1000 tweets with corresponding relevance score

Data Preprocessing

- Stop words, punctuation, numbers, urls removal
- Non-English character and word removal
- Stemming

Emotion Extraction

- For each tweet in the document set:
  - Predict the probability of each emotion
  - Total of 64 emotion classes
- Do the same for each tweet in the query set
- We get two vectors of 64 emotion class probabilities

* Emotion extraction paper [felbo2017]

Features used for LTR (MART, LambdaMART)

- **Baseline**
  - Cosine similarity between query and doc
  - Retweet counts
  - Favorited or not
- **Our Feature Vector**
  - Features from baseline
  - Emotion from query (64 classes)
  - Emotion from tweet/doc (64 classes)

Results

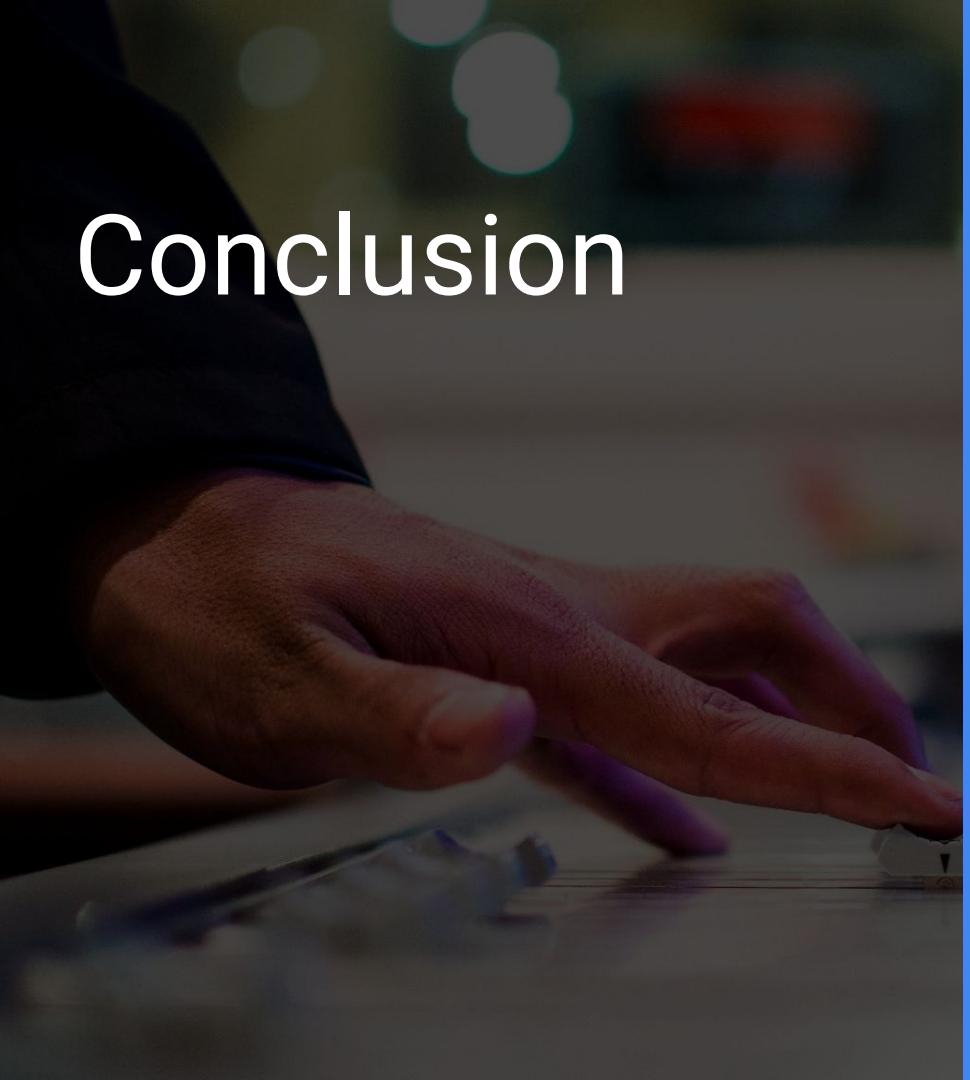
	Baseline		Baseline + Emoji	
	MART	LambdaMART	MART	LambdaMART
NDCG@10	0.4049	0.3779	0.4294	**0.4737**
P@10	0.149	0.1367	0.1633	**0.1755**

Improvement

	MART	Lambda MART
NDCG	**6.05%**	**25.35%**
MAP	**9.59%**	**28.38%**

Potential Improvements

- More evaluation data from TREC 2013
- 60 additional queries
- More documents

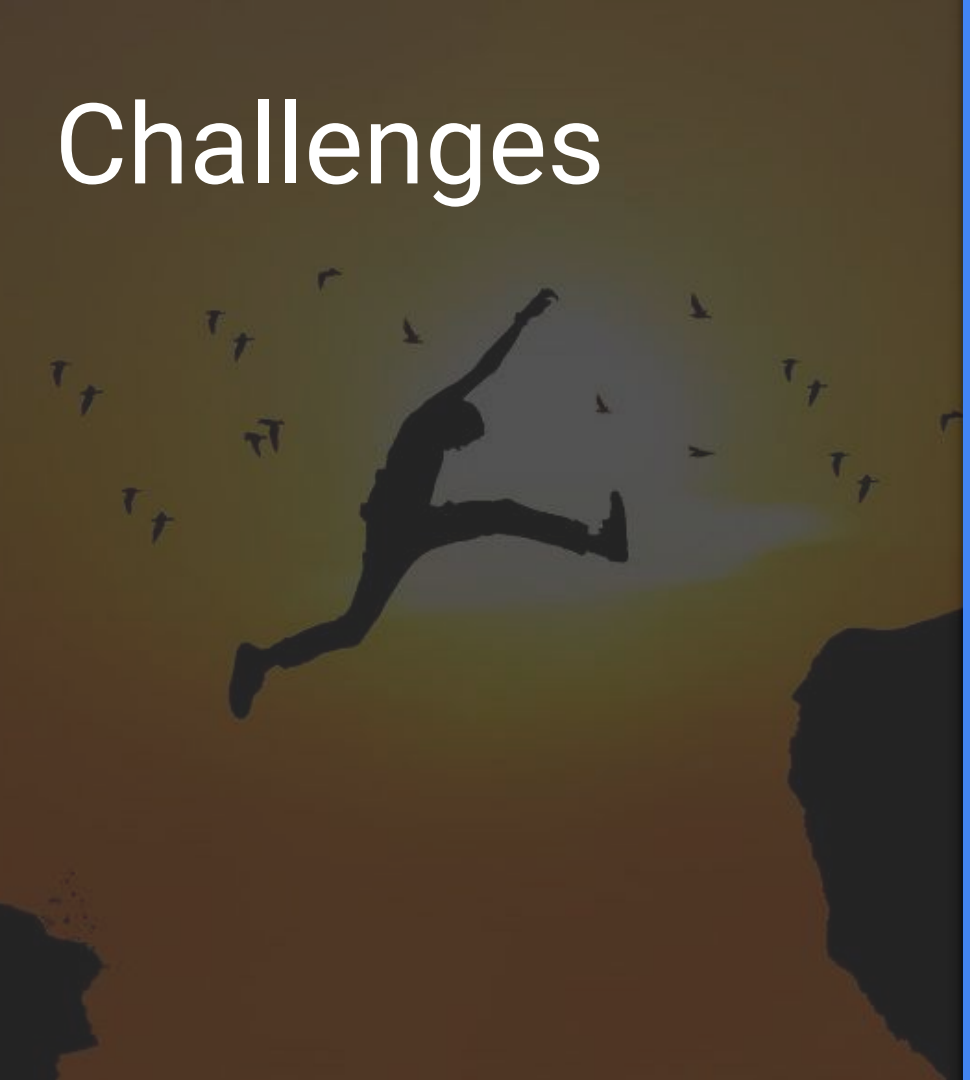


Conclusion

- Extracted emotion features from Microblog TREC dataset
- Fed it into the pipeline
- Got improvements over the baseline

Thank you!

Challenges



- **Evaluation Dataset**
- **Are Emotions Effective for other datasets?**