Letting Emotions Flow: Success Prediction by Modeling the Flow of Emotions in Books

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Motivation

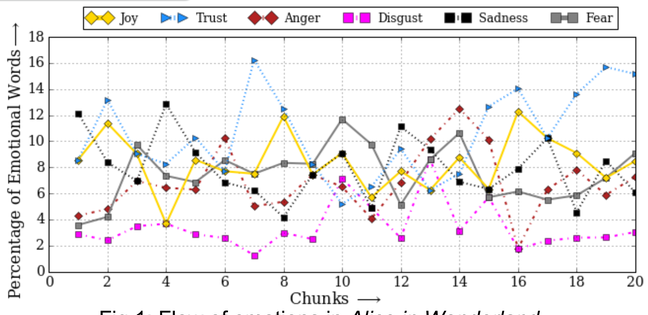


Fig 1: Flow of emotions in *Alice in Wonderland*

- Capture author's dexterity in use of emotions across book to predict book's likability

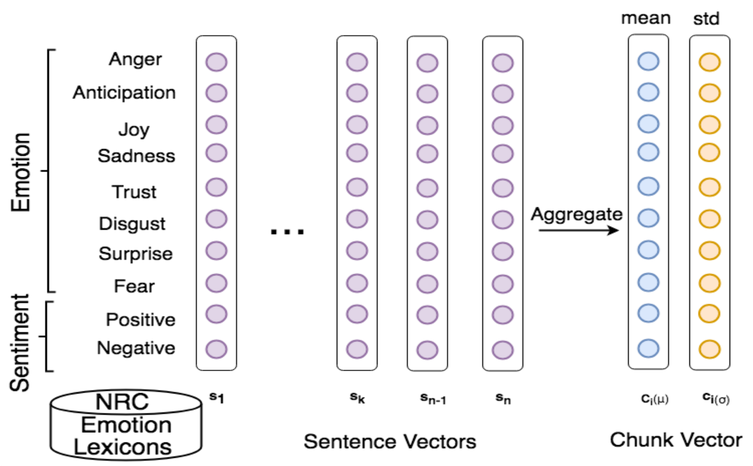
Dataset

$$Success(x = Book) = \begin{cases} 1 \text{ if average\_rating(x) >= 3.5 and \# rating(x) >=10} \\ 0 \text{ if average\_rating(x) < 3.5 and \# rating(x) >=10} \end{cases}$$

Category	Books
Successful	654
Unsuccessful	349

Table 1: Data distribution

Representation of Emotions



Multitask Emotion Flow Model

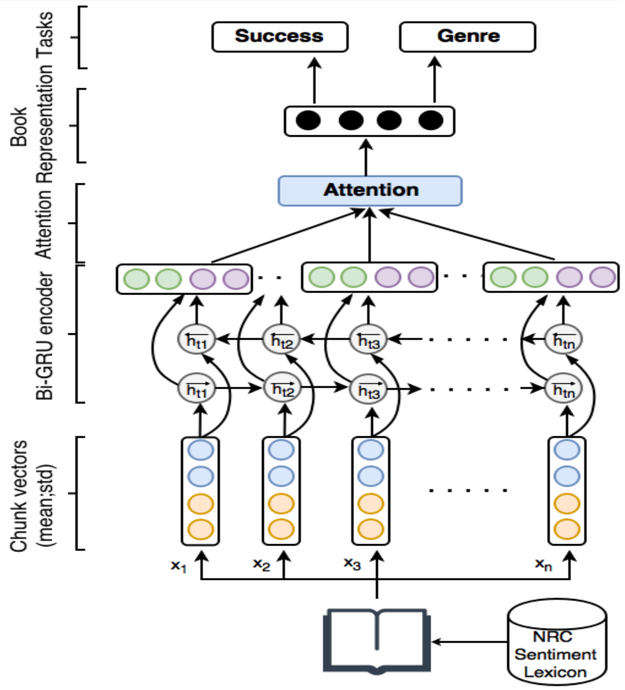


Fig 2: Multitask Emotion Flow Model

Results

Book Content		1000 Sentences		All	
Methods	**Chunks**	**ST**	**MT**	**ST**	**MT**
Majority Class	–	0.506	0.506	0.506	0.506
SentiWordNet + SVM	20	0.582	0.610	–	–
NRC + SVM	10	0.526	0.597	0.541	0.641
NRC + SVM	20	0.537	0.590	0.577	0.604
NRC + SVM	30	0.587	0.576	0.595	0.600
NRC + SVM	50	0.611	0.586	0.597	0.636
Emotion Flow	10	0.632	0.643	0.650	0.660
Emotion Flow	20	0.612	0.639	0.640	0.668
Emotion Flow	30	0.630	0.657	0.662	0.677
Emotion Flow	50	0.656	0.666	0.674	**0.690**

Table 2: Weighted F1-scores for success classification

Analysis

Attention

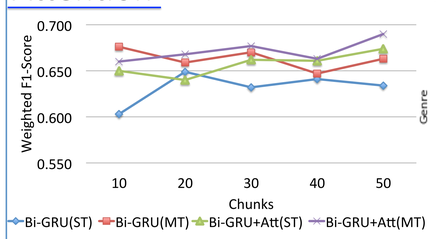


Fig 3: Comparison of the Emotion Flow with and without attention mechanism

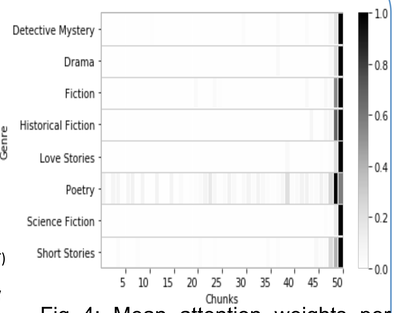


Fig 4: Mean attention weights per chunk per genre visualization

Emotion Shapes

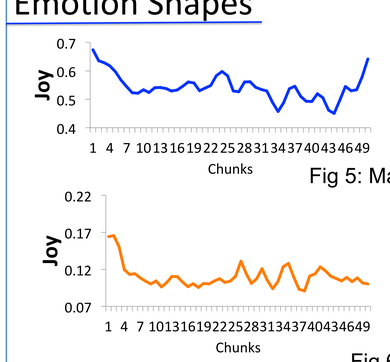


Fig 5: Man in the Hole

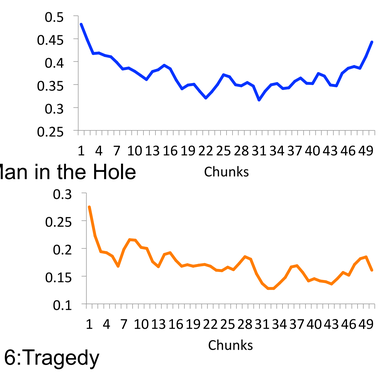


Fig 6:Tragedy

Climax Emotions

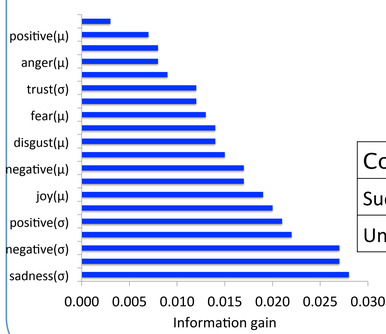


Fig 7: Feature ranking

	Joy		Sadness	
	μ	**σ**	**μ**	**σ**
Corpus	0.399	0.431	0.323	0.309
Successful	0.435	0.416	0.358	0.334
Unsuccessful	0.331	0.451	0.258	0.243

Table 3: Mean(**μ**) and standard deviation (**σ**) for joy and sadness for the last chunk

Conclusions and Future Work

- Modeling emotions as a sequential flow improves prediction accuracy
- Most attention weights are given to the last chunk for all genres except for *Poetry*
- Readers enjoy endings with stronger/well-defined emotions
- Use hierarchical methods with logical grouping to model emotion flow

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NAACL
June, 2018
New Orleans, Louisiana