This Just In: Fake News Packs a Lot in Title, Uses Simpler, Repetitive Content in Text Body, More Similar to Satire than Real News

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Why this work matters:

- Misinformation may cause political and societal decisions that run counter to a society's best interest
- While truth is hard to detect computational, early warning systems can assist both fact-checkers and news readers in their decisions
- Additionally, understanding what features distinguishes types of news can help us understand how users are persuaded

Q: Is there any **systematic stylistic** and **other content differences** between **fake** and **real** news?

We use three types of news:

✓ **Real** ✗ **Satire** ✗ **Fake**

- Use **2** different **independent** data sets of political news:

  Data set 1: Buzzfeed 2016 Election, highly engaged on Facebook

  Data set 2: Random political news

- Use **ANOVA** and **Wilcoxon** tests to find significant shifts in feature distributions
- Use **linear kernel SVMs** on top 4 most statistically significant features to show predictive power of features

	Real	Fake	Satire
Data set 1	36	35	0
Data set 2	75	75	75

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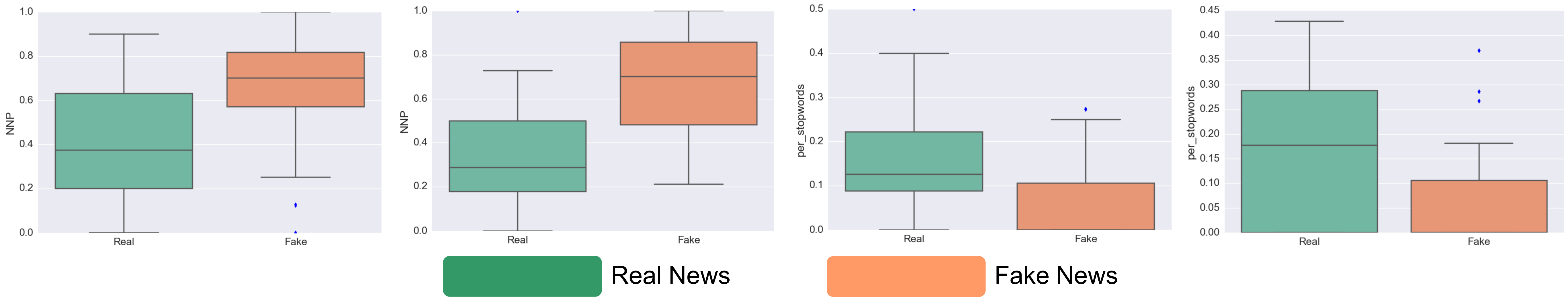
Types of features:

- **Complexity Features** : Natural language features that capture the intricacy of article and title (*Ex: readability, depth of syntax tree, fluency, lexical redundancy*)
- **Psychology Features** : Based on well studied psychological meaning of words using Linguistic Inquiry and Word Count (*Ex: analytic, insight, emotional tone, certainty, personal concerns*)
- **Stylistic Features** : Simple natural language features that capture the sentence structure and grammatical elements (*Ex: word count, quotes, verb phrases, personal pronouns, informal words*)

Number of Proper Nouns in Title — Data set 1, Data set 2

Percent Stop-words in Title — Data set 1, Data set 2



Body Content

Feature	Data set 1	Data set 2
Word Count	Real > Fake	Real > Fake > Satire
Fluency	Fake > Real	Satire = Fake > Real
Avg Word Len	Real > Fake	Real > Fake = Satire
Quotes	Real > Fake	Real > Fake = Satire
Readability		Real = Satire > Fake
Person pronoun		Satire > Fake > Real
Adverb		Satire = Fake > Real
Punctuation	Real > Fake	Real > Fake = Satire
You		Satire > Fake > Real
We		Fake > Real = Satire
Redundancy	Fake > Real	Satire > Fake > Real
Neg Emotion	Fake > Real	
Analytic words		Real > Fake = Satire
Syntax depth	Fake > Real	

Title Content

Feature	Data set 1	Data set 2
Word Count	Fake > Real	Fake > Real = Satire
Fluency	Fake > Real	Satire > Fake = Real
Avg Word Len		Real > Fake = Satire
All Caps	Fake > Real	Satire > Fake > Real
Readability	Real > Fake	Real > Satire = Fake
Person pronoun	Real > Fake	
Noun	Real > Fake	Real > Satire > Fake
Proper Noun	Fake > Real	Fake = Satire > Real
Posses Pronoun	Real > Fake	
Determiner	Real > Fake	
% Stop-words	Real > Fake	Real > Satire = Fake
Exclaim		Fake > Real = Satire
Analytic words	Fake > Real	
# Verb Phrases		Fake > Real = Satire

Features that significantly differ between news types. Significance determined by Wilcoxon Rank-Sum or ANOVA tests depending on the normality of the feature distribution. Significance is considered for p-values less than 0.05 and large F-values.

▭ **Strongest significance**

What we found out:

- Fake content differs in **word count**, **word length, # quotes,** and **redundancy**
- Fake titles use more **proper nouns**, **verb phrases**, & fewer **stop-words, nouns**

Fake Title: BREAKING BOMBSHELL: NYPD Blows Whistle on New Hillary Emails: Money Laundering, Sex Crimes with Children, Child Exploitation, Pay to Play, Perjury

Real Title: Preexisting Conditions and Republican Plans to Replace Obamacare

- Fake content is more similar to satire than to real, findings consistent on 3rd data set
- Real news persuades through arguments, while fake news persuades through heuristics

Linear SVM Classification Results:

	Baseline	Fake vs Real	Satire vs Real	Satire vs Fake
Body	50%	71%	91%	67%
Title	50%	78%	75%	55%

What we plan to do in the future:

- More data
- Create unsupervised ground truth
- Include news from across the spectrum

Acknowledgments

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