

Multilingual Fake News Detection with Satire

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Workshop 2021, Brest, France

Words/Machines #3

***Do machines have a
sense of humor?***

Context

Satire Detection: Some key points

- A classification task: **binary** or **multi-class**
- Satirical Tweet detection often **rely on source-level labels** (Burfoot et al. 2009; Barbieri et al. 2015; Volkova et al. 2017; etc.)
- Satire datasets are often **unbalanced** (Yang et al. 2017; Horne & Adali 2017)
- Many **shallow approaches**: kernel-based, tree-based, bagging, logistic regression, etc. (Ozbay et al. 2020)

Satire Detection: source-level example

- Source-level labels: Twitter account or website assigned label
- Source-level labels from **BuzzFeed dataset** (Horne et al. 2017):

Trusted	Wall Street Journal, The Economist, BBC, NPR, ABC, CBS, USA Today, The Guardian, NBC, The Washington Post
Satire	The Onion, Huffington Post Satire, Borowitz Report, The Beaverton, Satire Wire, and Faking News
Fake	Ending The Fed, True Pundit, abcnews.com.co, DC Gazette, Liberty Writers News, Before its News, InfoWars, Real News Right Now

Hackathon on NLP: HackaTAL 2018



Task

Identify and Categorize Fake News

Participants

6 teams ; 40 participants

Data Provider “storyzy

Storyzy company
Specialized in **disinformation** and
websites classification

Data Topic

Vaccination Fake News Dataset

Data Size

6358 articles

Data Information

EN & FR: mainly English

Dataset

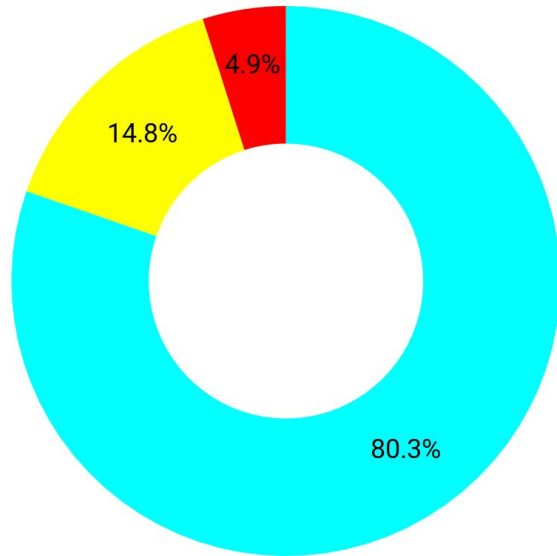
Fake News Dataset

- Train | Test distribution = 4767 | 1591
- Restricted information on Test

“storyzy

Language	Train	Test	Train format	Test format
English	3828	1277	id, domain, type, uri, author, language, title, text, date, external_uris	id, title, text
French	705	236	id, domain, type, uri, author, language, title, text, date, external_uris	id, title, text
YouTube	234	78	video-id, channel-id, video-title, video-view-count, lang, type, channel-title, text, id	id, video-title, text

Multilingual Dataset



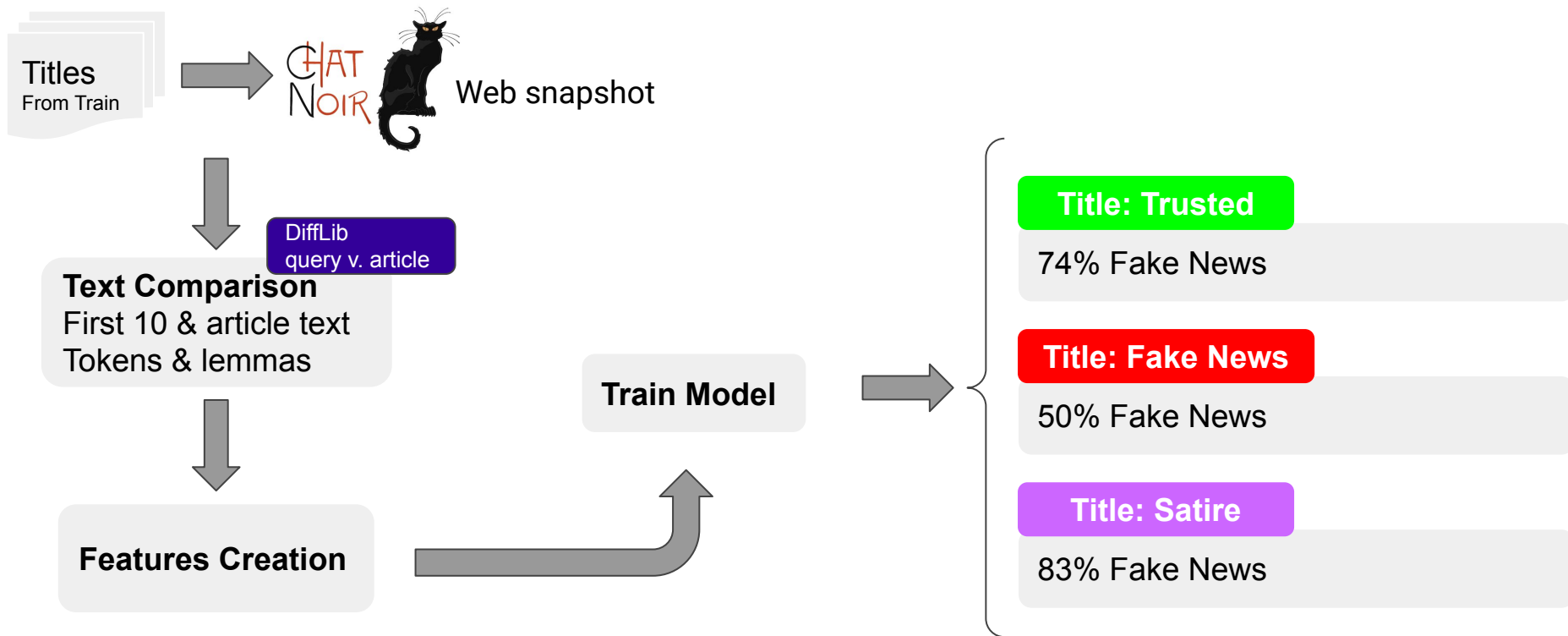
- English
- French
- YouTube (FR)

3 classes

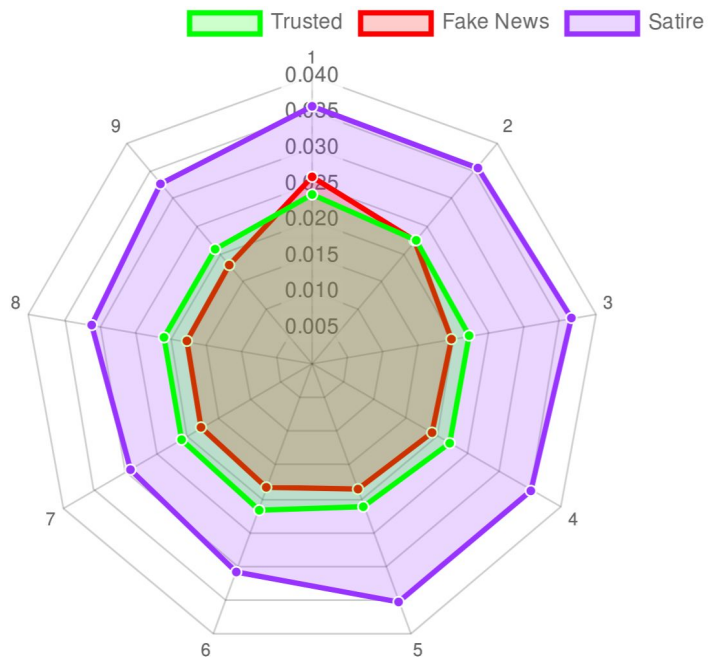


Textual Features and Exploration

Domain Type Detection



Text Resemblance



Average Comparison

Train text + ChatNoir results

Irregular Ratios

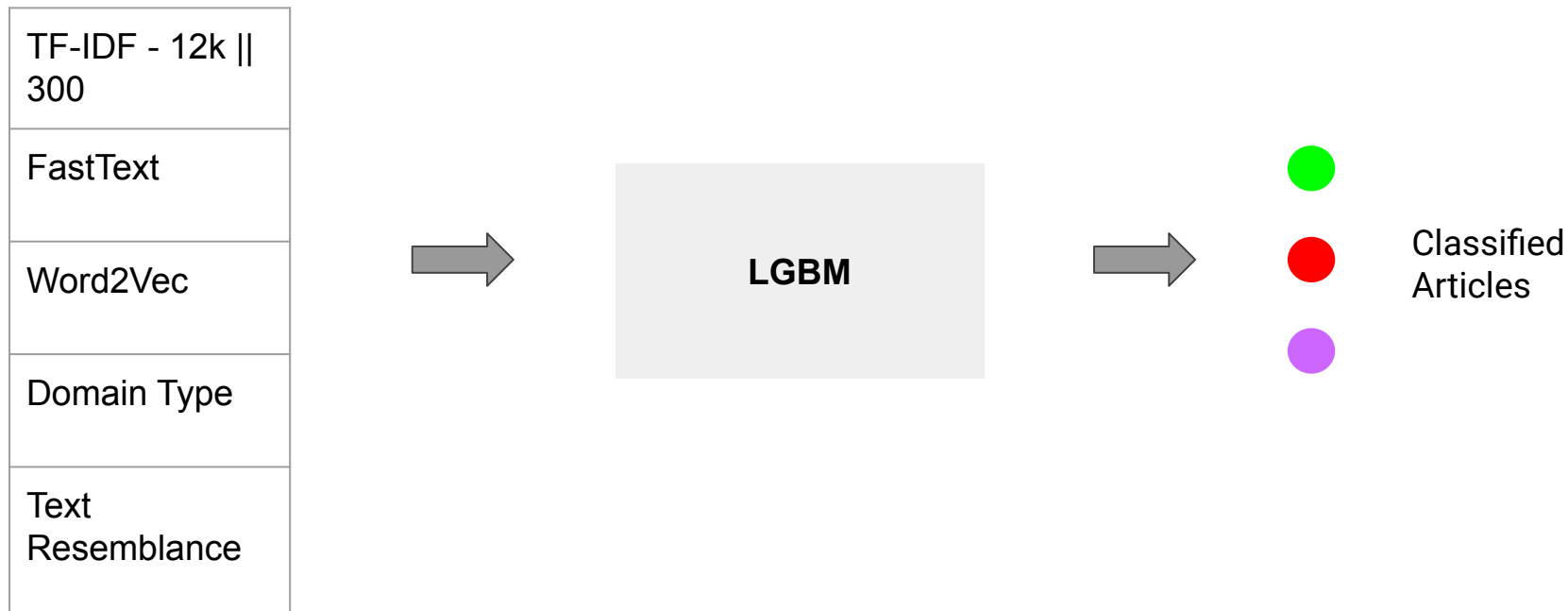
Irregular ratios for Fake and Satire

Satire Peculiar Subjects

Facebook, Pharma, Science, Monsanto, etc.

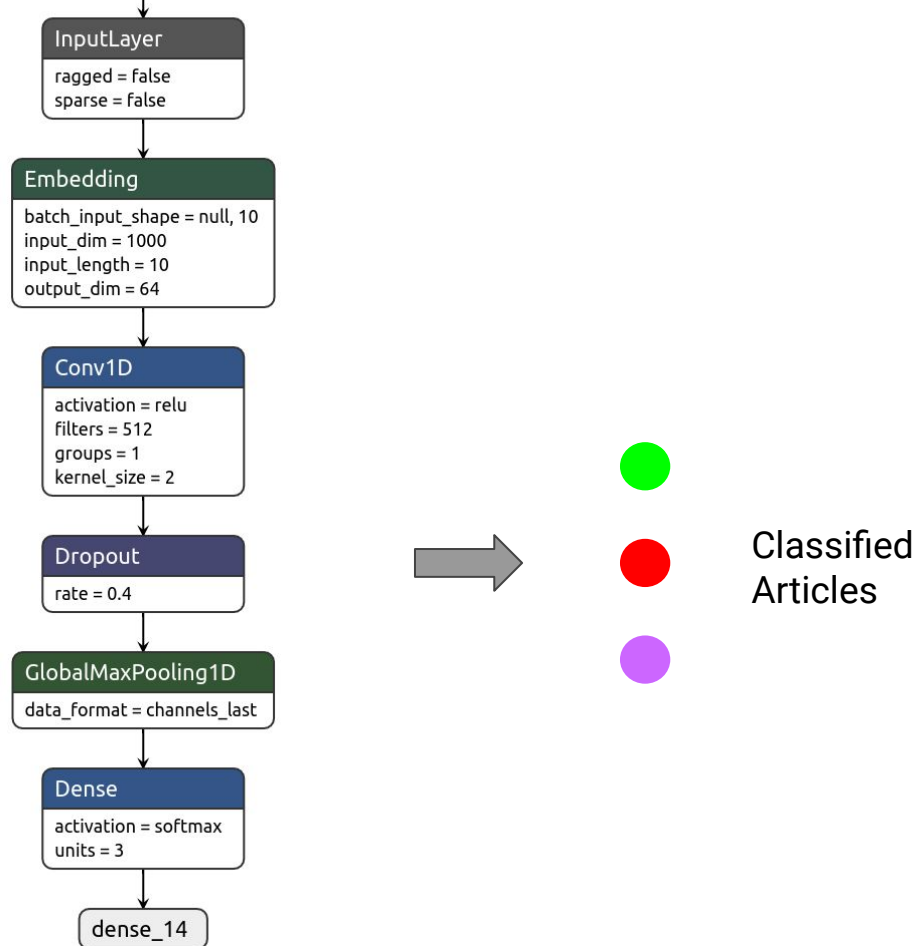
Classification Task

Classification: Feature Stacking + LGBM

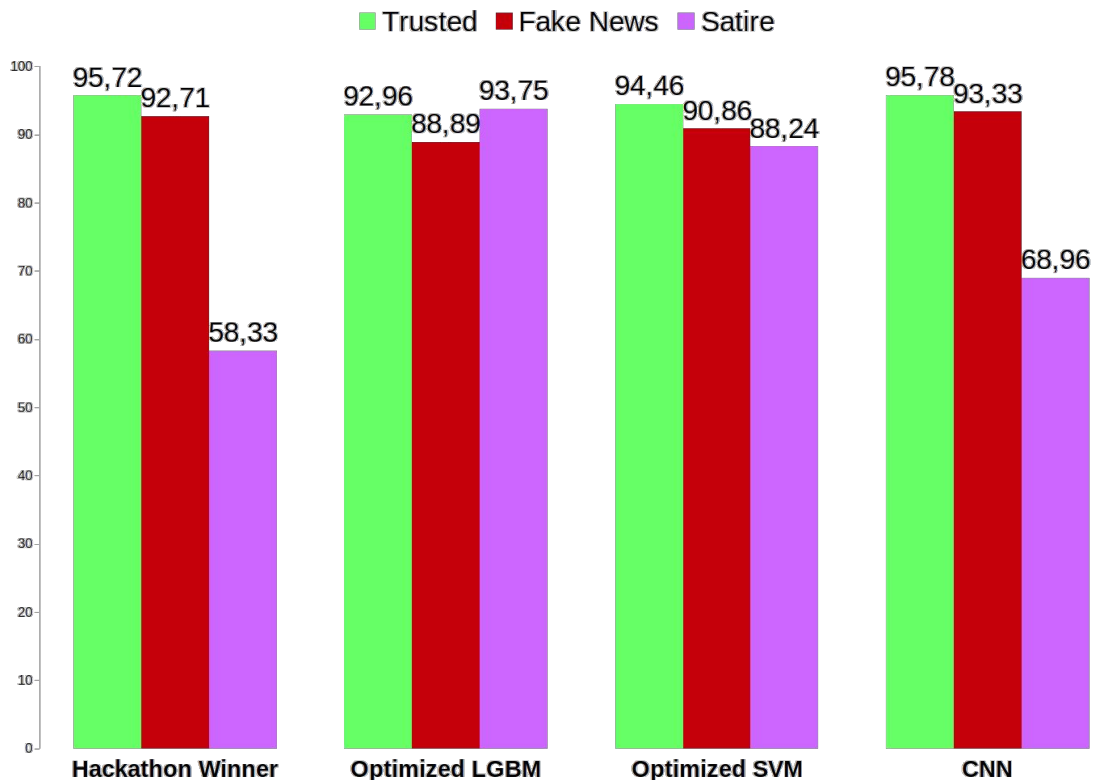


Classification: CNN

- Features = Embedding layer
- Allows approach comparison
 - Standard embedding
 - Feature Stacking



Classification: F1 scores



- CNN and SVM for Trusted and Fake
- Satire requires a balanced model

	Macro F1
CNN	86.02 %
LGBM	91.87 %

Some conclusions

- **Stacking > scaling**: opposite to (Burfoot et al. 2009) on Satire Detection
 - Sparser cases of satire
- Results indicates **tree based algorithms** are better suited for the task
 - Confirmed later by (Ozbay et al. 2020)
- Deeper Neural Architectures led to high bias and variance
 - LSTM, LSTM-CNN
- **Redundancy** in representation yields better performances

Thank you!

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Any questions?

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Workshop 2022 Brest, France

World's Machines #3

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