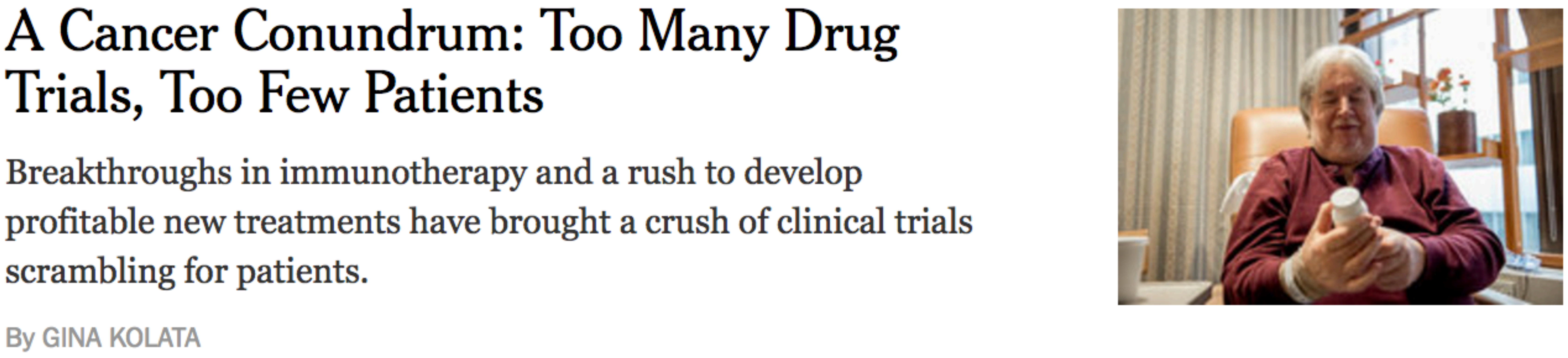
Text Classification

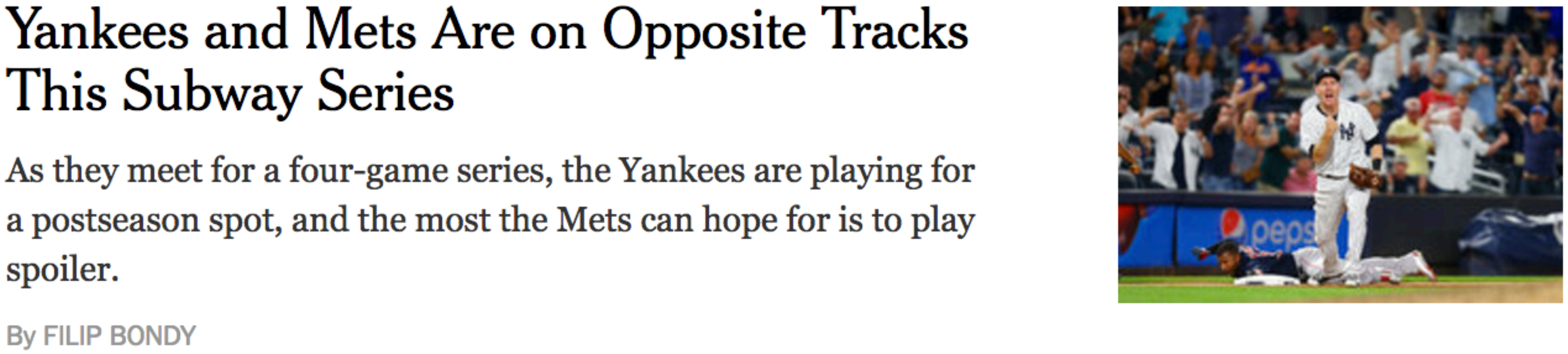


A Cancer Conundrum: Too Many Drug Trials, Too Few Patients

Breakthroughs in immunotherapy and a rush to develop profitable new treatments have brought a crush of clinical trials scrambling for patients.

By GINA KOLATA

→ Health



Yankees and Mets Are on Opposite Tracks This Subway Series

As they meet for a four-game series, the Yankees are playing for a postseason spot, and the most the Mets can hope for is to play spoiler.

By FILIP BONDY

→ Sports

~20 classes

- 20 Newsgroups, Reuters, Yahoo! Answers, …

Textual Entailment

- Three-class task over sentence pairs

- Not clear how to do this with simple bag-of-words features

A soccer game with multiple males playing.

ENTAILS

Some men are playing a sport.

A black race car starts up in front of a crowd of people.

CONTRADICTS

A man is driving down a lonely road

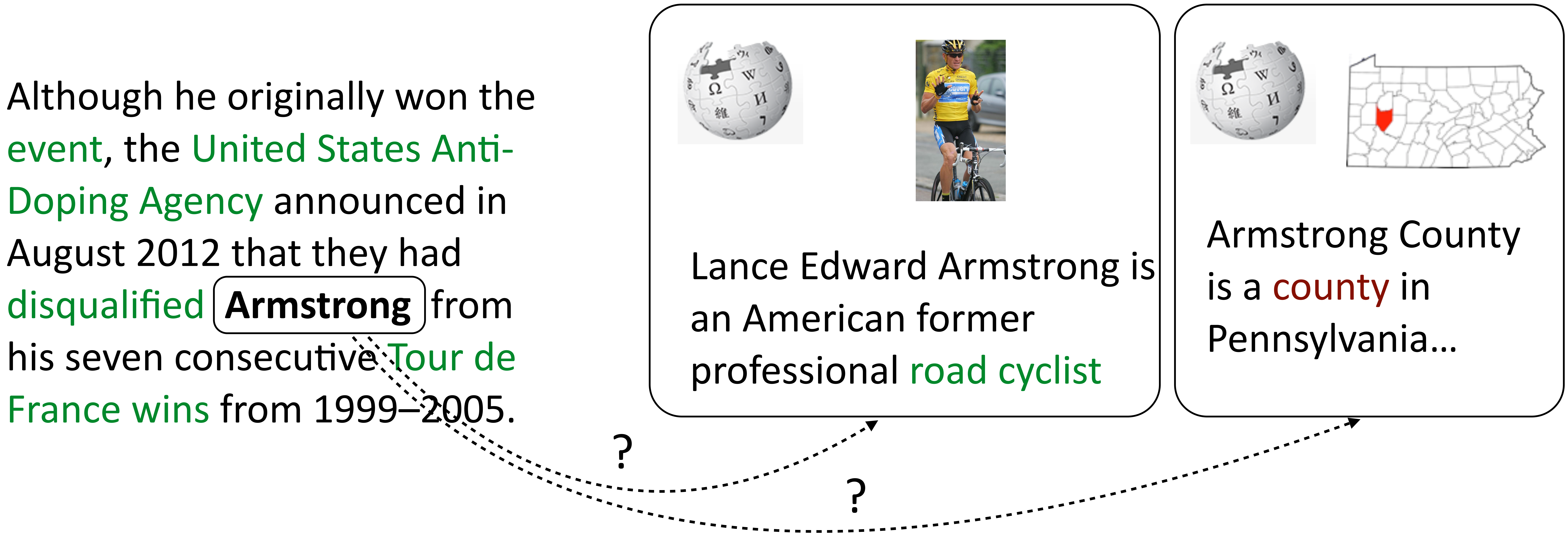
A smiling costumed woman is holding an umbrella.

NEUTRAL

A happy woman in a fairy costume holds an umbrella.

Bowman et al. (2015)

Entity Disambiguation/Entity Linking



Although he originally won the event, the United States Anti-Doping Agency announced in August 2012 that they had disqualified **Armstrong** from his seven consecutive Tour de France wins from 1999–2005.

Lance Edward Armstrong is an American former professional road cyclist

Armstrong County is a county in Pennsylvania…

- 4,500,000 classes (all articles in Wikipedia)
- Needs a very different structure for *f*(***x***,***y***) to accommodate so many classes

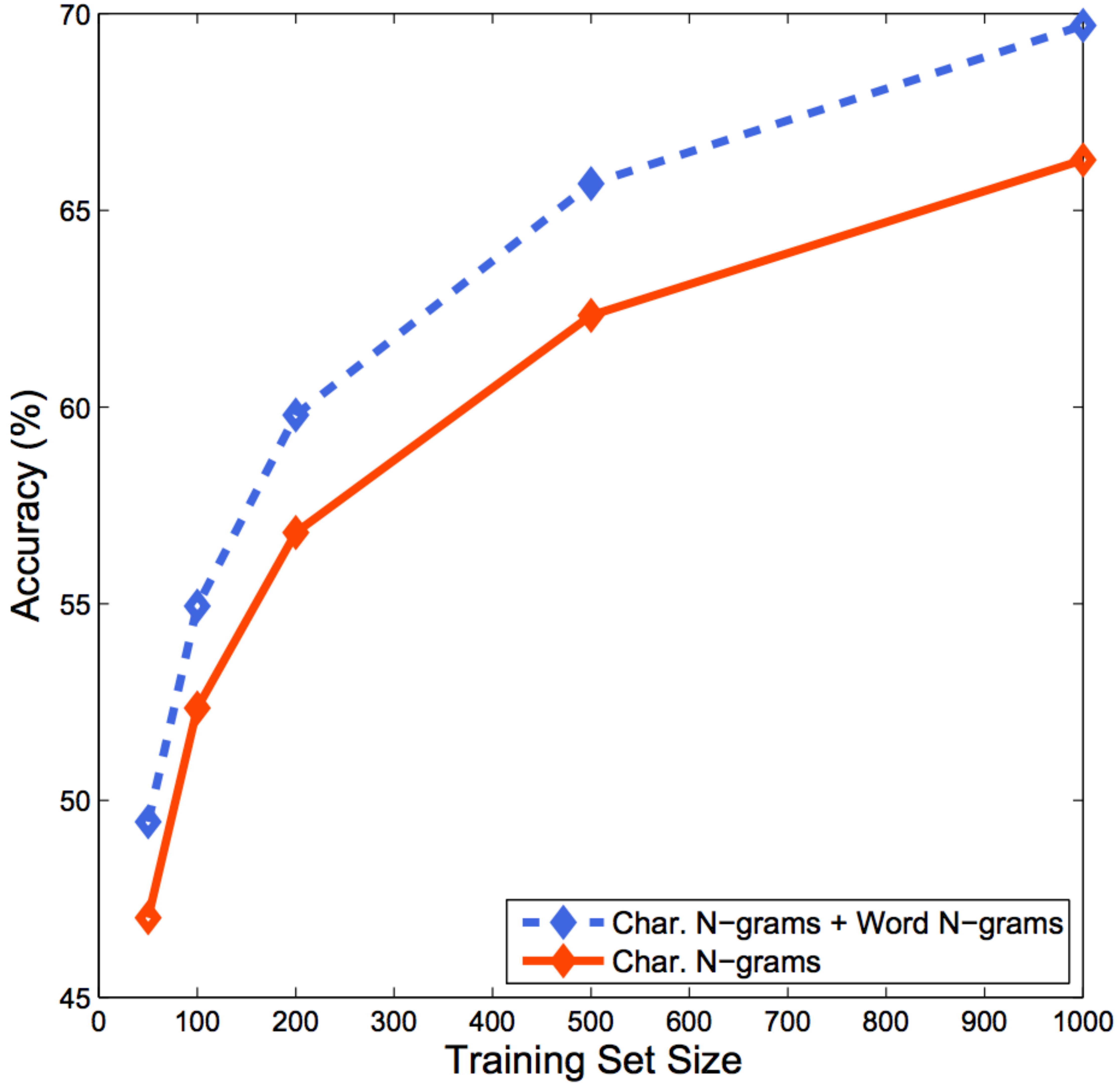
Authorship Attribution

- Statistical methods date back to 1930s and 1940s
  - Based on handcrafted heuristics like stopword frequencies
  - Early work: Shakespeare's plays, Federalist papers (Hamilton v. Madison)
- Twitter: given a bunch of tweets, can we figure out who wrote them?
  - Schwartz et al. EMNLP 2013: 500M tweets, take 1000 users with at least 1000 tweets each
- Task: given a held-out tweet by one of the 1000 authors, who wrote it?

Authorship Attribution

- SVM with character 4-grams, words 2-grams through 5-grams

50-author task



Schwartz et al. (2013)

Authorship Attribution

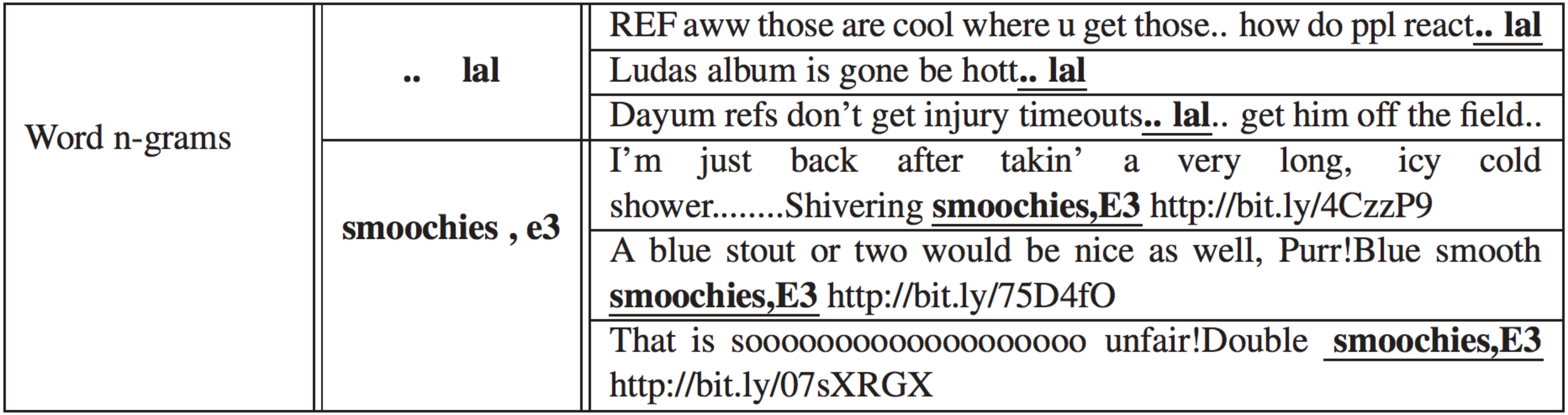
- k-signature: n-gram that appears in k% of the authors tweets but not appearing for anyone else — suggests why these are so effective

Signature Type	10%-signature	Examples
Character n-grams	‘ ^_^’	REF oh ok ^_^ Glad you found it!
		Hope everyone is having a good afternoon ^_^
		REF Smirnoff lol keeping the goose in the freezer ^_^
	‘yew ’	gurl **yew** serving me tea nooch
		REF about wen **yew** and ronnie see each other
		REF lol so **yew** goin to check out tini’s tonight huh???

Schwartz et al. (2013)

Authorship Attribution

- k-signature: n-gram that appears in k% of the authors tweets but not appearing for anyone else — suggests why these are so effective



Word n-grams	**.. lal**	REF aww those are cool where u get those.. how do ppl react**.. lal**
		Ludas album is gone be hott**.. lal**
		Dayum refs don't get injury timeouts**.. lal**.. get him off the field..
	smoochies , e3	I'm just back after takin' a very long, icy cold shower........Shivering **smoochies,E3** http://bit.ly/4CzzP9
		A blue stout or two would be nice as well, Purr!Blue smooth **smoochies,E3** http://bit.ly/75D4fO
		That is sooooooooooooooooooo unfair!Double **smoochies,E3** http://bit.ly/07sXRGX

Schwartz et al. (2013)