

# Disinformation on the Web: Impact, Characteristics, and Detection of Wikipedia Hoaxes



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# Web: Source of information



# Web: Source of false information



## BuzzFeedNEWS

News Videos Quizzes Tasty DIY



TRENDING  
209,321 VIEWS

### Viral Fake Election News Outperformed Real News On Facebook In Final Months Of The US Election

A BuzzFeed News analysis found that top fake election news stories generated more total engagement on Facebook than top election stories from 19 major news outlets combined.

INDEPENDENT News US Election Voices Culture

EXPERIENCE THE NEW CISION COMMUNICATION CLOUD™  
Take a demo today!  
TAKE A DEMO  
CISION

Lifestyle > Tech > News

### Facebook hoaxes didn't affect US election says Mark Zuckerberg

A made-up news story with the headline 'FBI agent suspected in Hillary email leaks found dead in a car crash' was shared more than 560,000 times on Facebook.

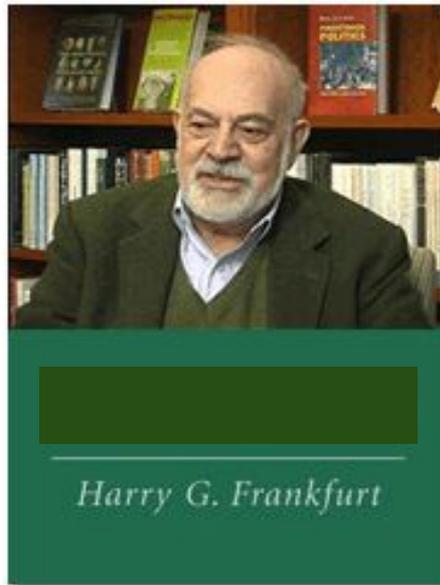


# Types of false information



Misinformation  
honest mistake

Disinformation  
deliberate lie to mislead



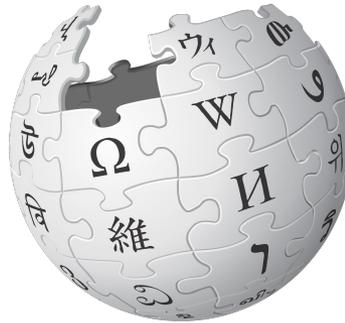
Hoax

“deliberately  
fabricated falsehood  
made to masquerade  
as truth”

Wikipedia

# Why Wikipedia?

- Freely accessible
- Large reach
- Major source of information for many



Easy to add (false) information

WIKIPEDIA

The **free** encyclopedia that **anyone can edit**

# Hoaxes on Wikipedia

The image shows two overlapping screenshots of the Wikipedia website. The background screenshot displays the main Wikipedia page with the logo and navigation menu. The foreground screenshot shows the article "Wikipedia:List of hoaxes on Wikipedia/Balboa Creole French".

**Wikipedia:List of hoaxes on Wikipedia/Balboa Creole French**

From Wikipedia, the free encyclopedia

< Wikipedia:List of hoaxes on Wikipedia

This is an **old revision** of this page, as edited by **108.215.62.12** (talk) at 11:56, 21 July 2012. The present address (URL) is a **permanent link** to this revision, which may differ significantly from the **current revision**.

(diff) ← Previous revision | Latest revision (diff) | Newer revision → (diff)

**This article does not cite any references (sources).** Please help improve this article by adding citations to reliable sources. Unourced material may be challenged and removed. (January 2010)

**Balboa French Creole** is a **Creole** language used in **Balboa Island** in the city of **Newport Beach, California**. It originated from a blending of French spoken by French families on the island with **English**, **Spanish**, and **German**, all which are spoken by some members of the Balboa Island community. Balboa Creole French differs highly from Standard French and is incomprehensible to the majority of French speakers. People from **Haiti** or the French Caribbean can sometimes understand the Creole, but it remains unintelligible to the masses. Some major differences are its subjects which are *Jah* or *Mwa*, *Tu*, *Vous* or *Tu'z All*, *Nos*, *Il*, *Elle*, *Ilz* or *Ellez* and *Dem*. In a census published in 2009, it was revealed only 14 people on the island can still speak the language.

Balboa Creole French	
<b>Native to</b>	California
<b>Region</b>	limited to quarters of Balboa Island
<b>Native speakers</b>	virtually extinct; a few families are bilingual in either English, or rarely in French ( <i>date missing</i> )
<b>Language family</b>	Creole <ul style="list-style-type: none"><li>Balboa Creole French</li></ul>
Language codes	
<b>ISO 639-2</b>	cpf
<b>ISO 639-3</b>	–

# Data: Wikipedia Hoaxes

Hoax article vs. hoax facts

# Data: Wikipedia Hoaxes

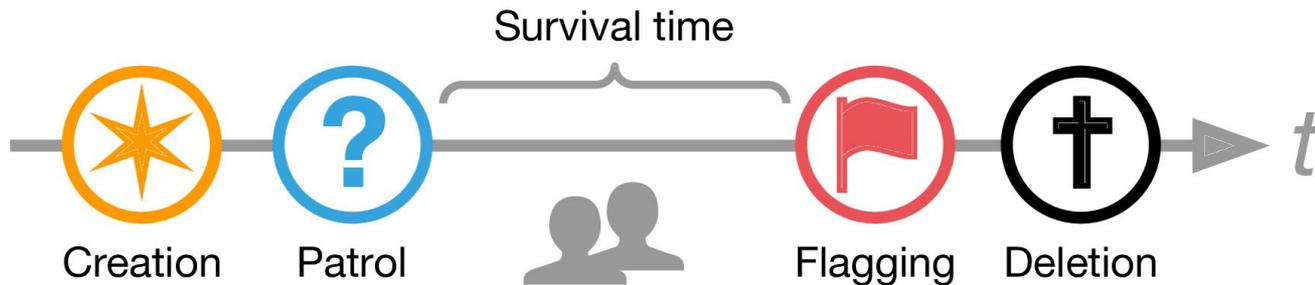
Hoax article vs. hoax facts

21,218 hoax articles



**The truthfulness of this article has been questioned.** It is believed that some or all of its content *may* constitute a **hoax**. Please carefully verify any **reliable sources** used to support the claims in the article or section, and add reliable sources for any uncited claims. If the claims cannot be reliably sourced, consider placing the article at **articles for deletion** and/or removing the section in question. *For blatant hoaxes, use `{{db-hoax}}` to identify it for *speedy deletion* instead.* Further information and discussion may be on the article's **talk page**. *(November 2015)*

Hoax lifecycle:



# Wikipedia hoaxes

**Impact  
of hoaxes**

What is the  
impact of  
hoaxes?

Characteristics  
of hoaxes

What do hoaxes  
look like?

Detection  
of hoaxes

Can we find  
hoaxes  
automatically?

# Impact of hoaxes

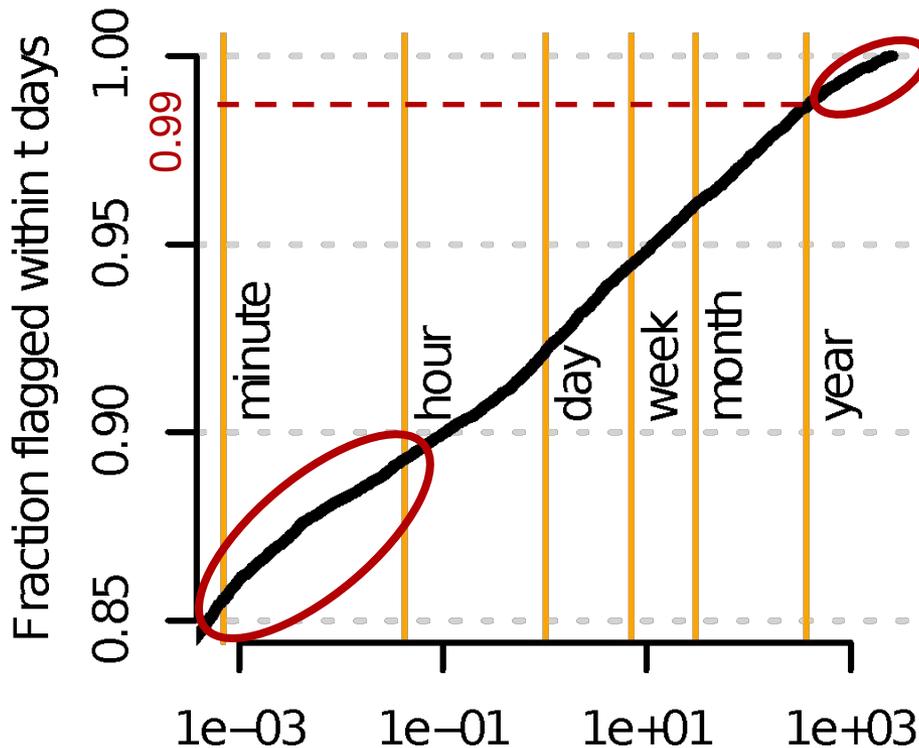
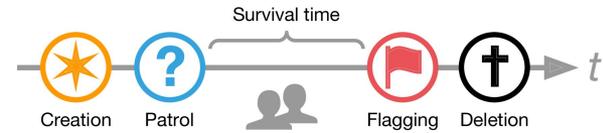
“The worst hoaxes are those which  
(a) last for a long time,  
(b) receive significant traffic,  
(c) are relied upon by credible news media.”

[Wikipedia founder Jimmy Wales on Quora]

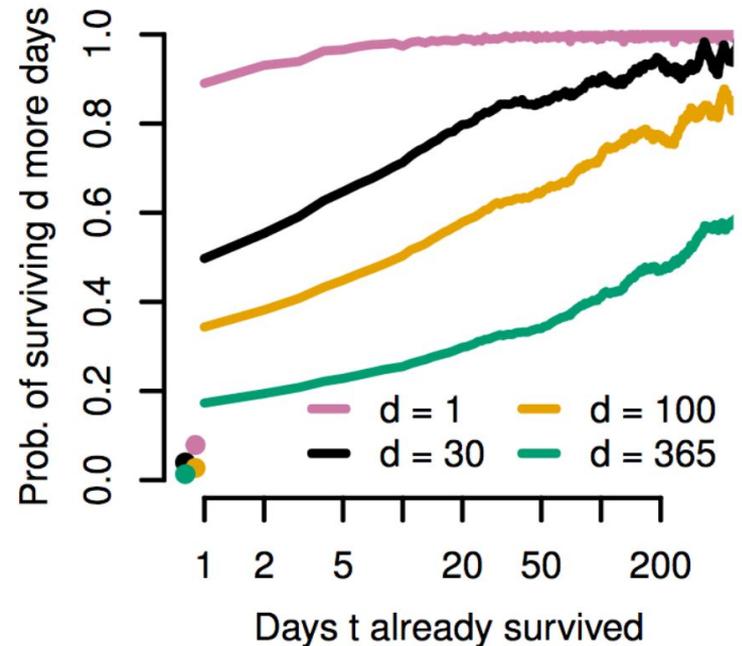


# Impact of hoaxes

“The worst hoaxes are those which  
(a) last for a long time”

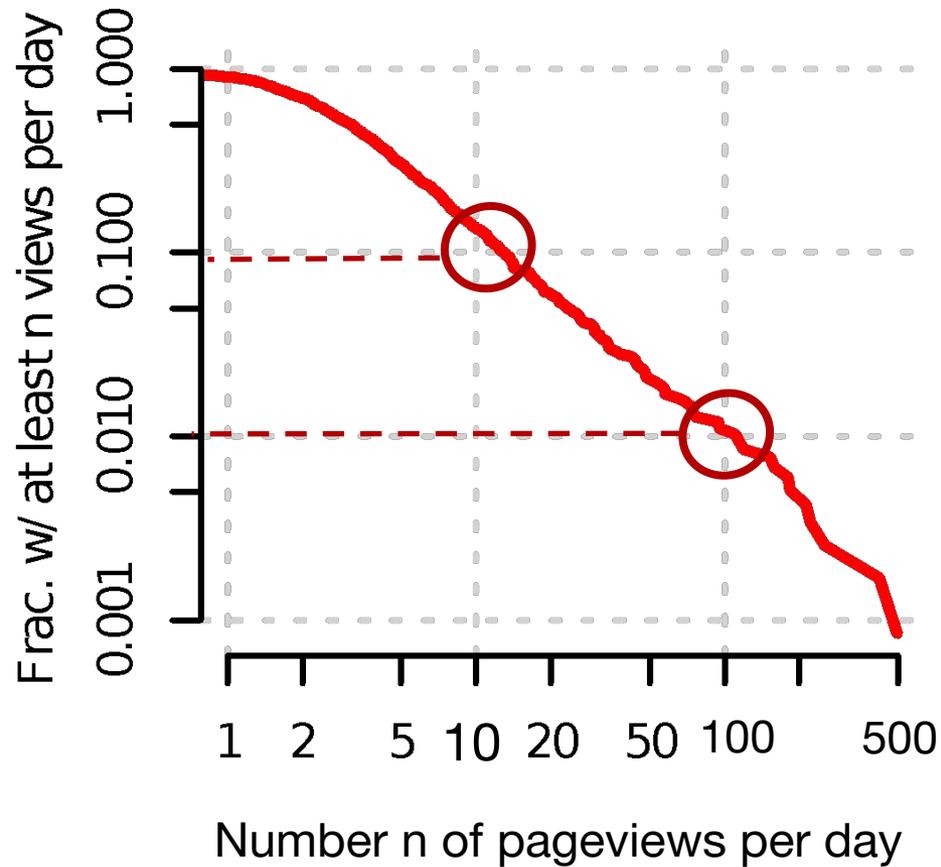


Time  $t$  between patrolling and flagging



# Impact of hoaxes

“The worst hoaxes are those which  
(b) receive significant traffic”



# Impact of hoaxes

“The worst hoaxes are those which  
(c) are relied upon by credible news media”

inlinks from entire Web

# Wikipedia hoaxes

Impact  
of hoaxes

Most hoaxes are caught soon, but some hoaxes are impactful

Characteristics  
of hoaxes

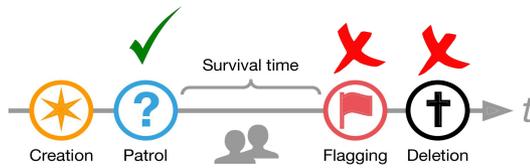
What do hoaxes look like?

Detection  
of hoaxes

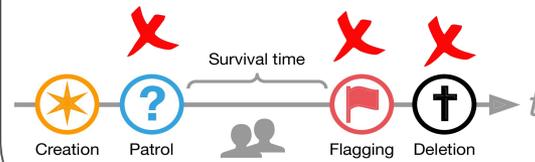
Can we find hoaxes automatically?

# Hoax

Successful hoax  
pass patrol  
survive for a month  
viewed frequently

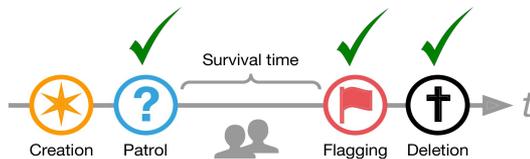


Failed hoax  
flagged and  
deleted during  
patrol

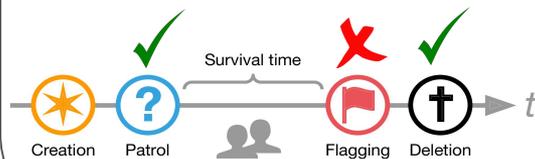


# Non-hoax

Legitimate  
articles  
never flagged



Wrongly flagged  
temporarily flagged



# Characteristics of hoaxes

**Appearance:**  
how the article  
looks

**Link network:**  
how the article  
connects

**Support:**  
how other  
articles refer to it

**Editor:**  
how the article  
creator looks

# Characteristics of hoaxes

**Appearance:**  
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creator looks

## Features:

- Plain-text length
- Plain-text-to-markup ratio
- Wiki-link density
- Web-link density

impact, due to the young age and small size of the school, it tends to rank comparatively low in nan being the [\[\[Times Higher Education World University Rankings|Times\]\]](#) 2017 reputation ranking where E for EPFL.[<ref>{{cite web|url=https://www.timeshighereducation.com/world-university-rankings/2017/sub/0/length/25/sort\\_by/rank/sort\\_order/asc/cols/stats|title=World Reputation Rankings 2017|work=Times </ref>](#) In recent years, multiple EPFL faculty members have been selected as Young Global Leader or a Forum, increasing the visibility of EPFL outside tech-circles.[<ref>{{cite web|url=http://widgets.wef Leaders: the class of 2015|publisher=|accessdate=19 July 2015}}</ref>](#)

The [\[\[Times Higher Education World University Rankings|Times\]\]](#) 100 Under 50 Rankings is a ranking of 50 years old. Since EPFL in its current form was formed in 1969, EPFL is included in this ranking. E years in a row in 2015,[<ref>{{cite web | url = https://www.timeshighereducation.com/world-university-rankings/2015/one-hundred-under-fifty | title = 100 Under 50 Rankings | website = Times Higher Education \(THE\) | access-date = 2016-02-29 }}</ref>](#) 2016 [<ref>{{cite web|url=http://actu.epfl.ch/news/epfl-keeps-the-lead-of-the-young-universi Young Universities Ranking"|website=actu.epfl.ch|access-date=2016-04-07}}</ref>](#)[<ref>{{cite web|url= university-rankings/2016/one-hundred-fifty-under-fifty#!page/0/length/25/sort\\_by/rank\\_label/sort\\_or Rankings|website=Times Higher Education \(THE\)|access-date=2016-04-07}}</ref>](#) and 2017.[<ref>{{cite we /world-university-rankings/2017/young-university-rankings#!page/0/length/25/sort\\_by/rank/sort\\_order Education \(THE\)|access-date=2017-06-22}}</ref>](#) Times Higher Education also ranked EPFL as the most i years in a row 2014[<ref>{{cite web | url = https://www.timeshighereducation.com/news/the-100-most-international-universities-in-the-wor | title = The 100 most international universities in the world 2014 | website = Times Higher Education \(THE\)](#)

Hoax articles are longer, but they mostly have plain text and have fewer Web and wiki links.

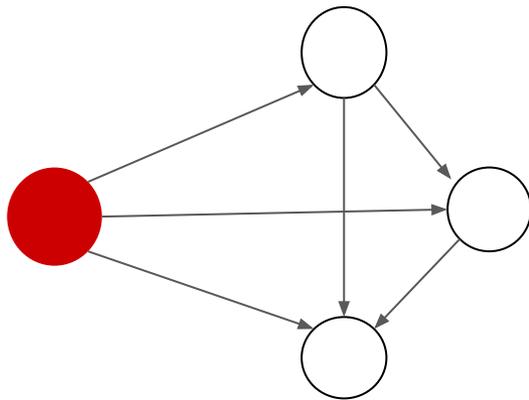
# Characteristics of hoaxes

**Appearance:**  
hoaxes mostly have text and few references.

**Link network:**  
how the article connects

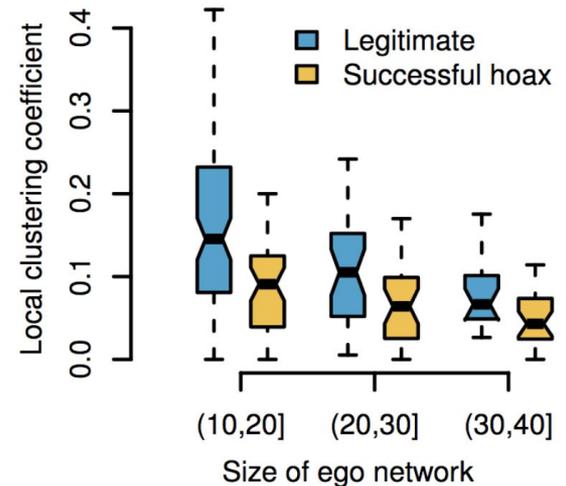
**Support:**  
how other articles refer to it

**Editor:**  
how the article creator looks



Ego network

**Clustering coefficient:**  
Fraction of length-2 paths  $(u,v,w)$  for which  $(u,w)$  is also an edge



**Legitimate articles are more coherent than successful hoaxes**

# Characteristics of hoaxes

**Appearance:**  
hoaxes mostly  
have text and  
few references.

**Link network:**  
hoaxes have  
incoherent  
wikilinks.

**Support:**  
how other articles  
refer to it

**Editor:**  
how the article  
creator looks

## Features:

- Number of prior mentions
- Time since first mention
- Creator of first mention

Hoax mentions are fewer in number,  
more recently created, and  
mostly created anonymously or by  
hoax creator

# Characteristics of hoaxes

**Appearance:**  
hoaxes mostly  
have text and  
few references.

**Link network:**  
hoaxes have  
incoherent  
wikilinks.

**Support:**  
hoaxes have few,  
recent, suspicious  
mentions.

**Editor:**  
how the article  
creator looks

**Features:**

- Creator's age
- Creator's experience

**Hoax creators are more recently  
registered, and  
have less editing experience.**

# Wikipedia Hoaxes

## Impact of hoaxes

Most hoaxes are caught soon, but some hoaxes are impactful

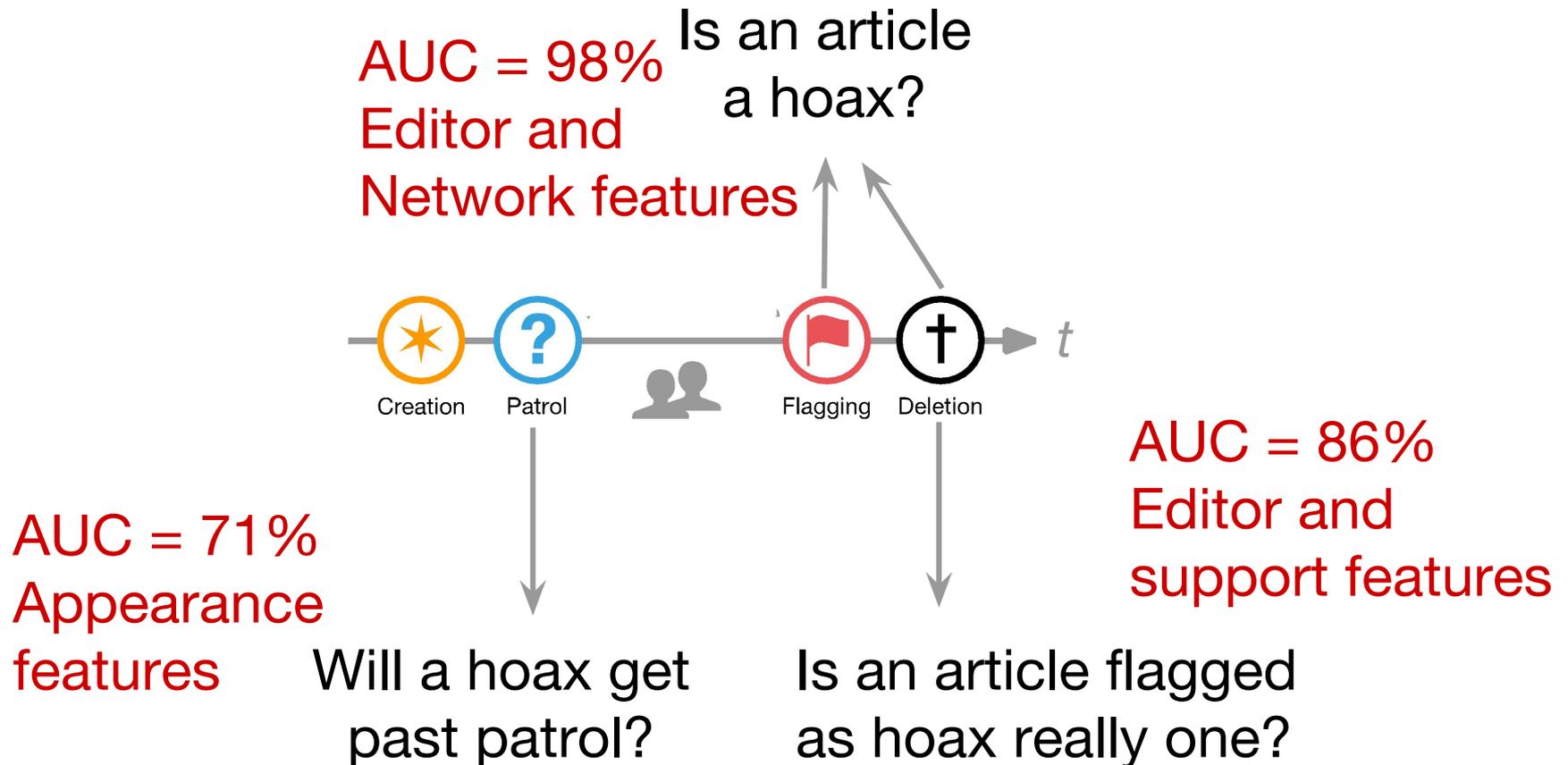
## Characteristics of hoaxes

Hoaxes are different from non-hoaxes in many respects

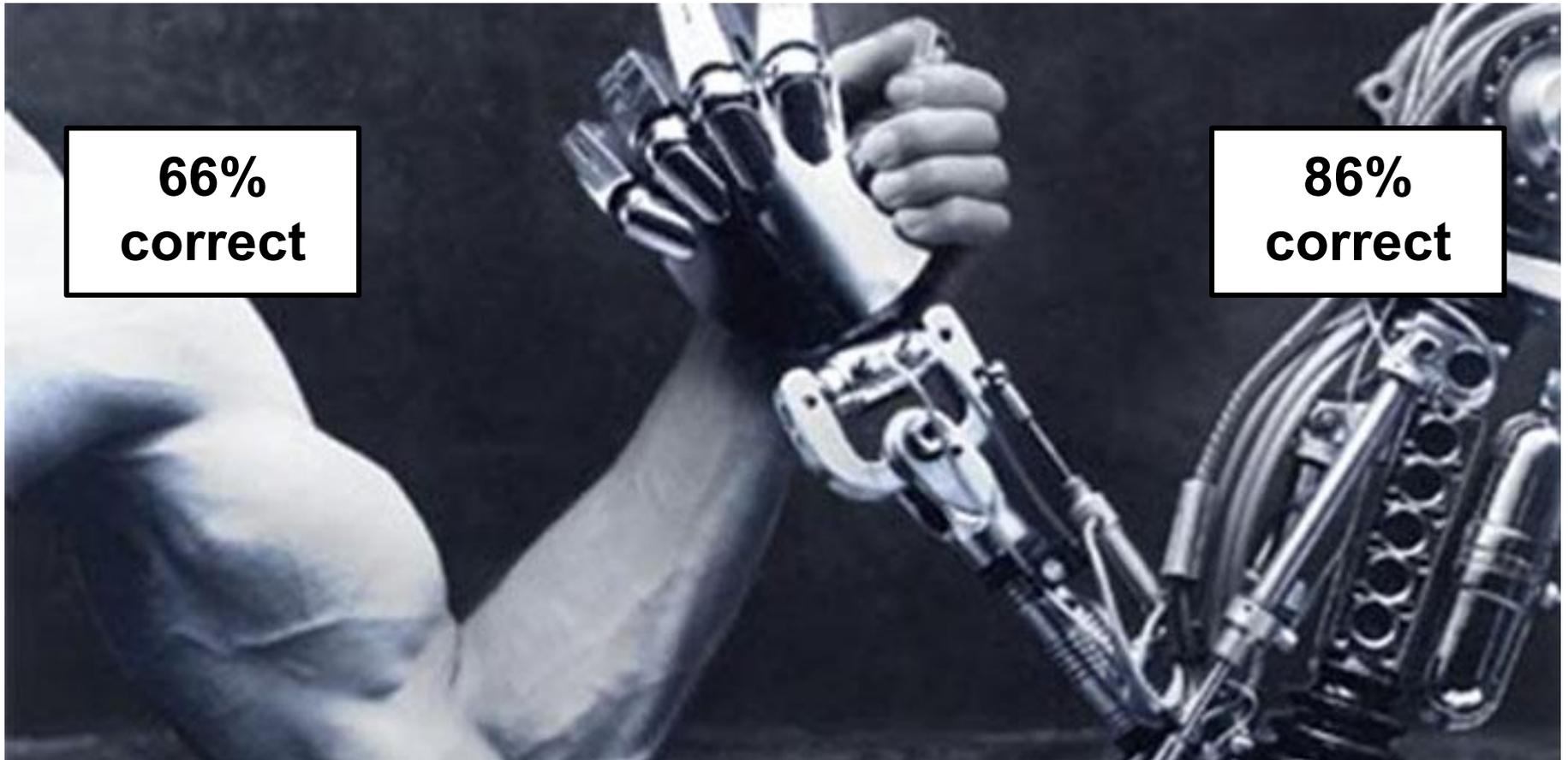
## Detection of hoaxes

Can we find hoaxes automatically?

# Detection of hoaxes



# Guessing experiment: Is article a hoax?



# We discovered previously unknown hoaxes!

Flagged by us and deleted by Wikipedia administrators

Steve Moertel

Popcorn entrepreneur

6 years 11 months!

Maurice Foxell

Children's book author and  
Knight Commander of  
Royal Victorian Order

1 year 7 months!

# Further questions

- Why do people create hoaxes?
- Who believes them?
- How does information about them spread on the Web?
- Relation to social media?
- ...

## Related work: Satirical news



<http://unfun.me>

Margaret Thatcher's Ashes  
Scattered Over **Free Market**

Margaret Thatcher's Ashes Scattered Over **Atlantic Ocean**

Words changed: **2**

**Done!**

Skip »

This talk  
was just a  
hoax!

**THANKS!**  
Questions?

Just kidding.  
More info:

[go.epfl.ch/wiki-hoaxes](http://go.epfl.ch/wiki-hoaxes)

