

How to Sound Like a Human

(by forgetting your past)

Alan Huang

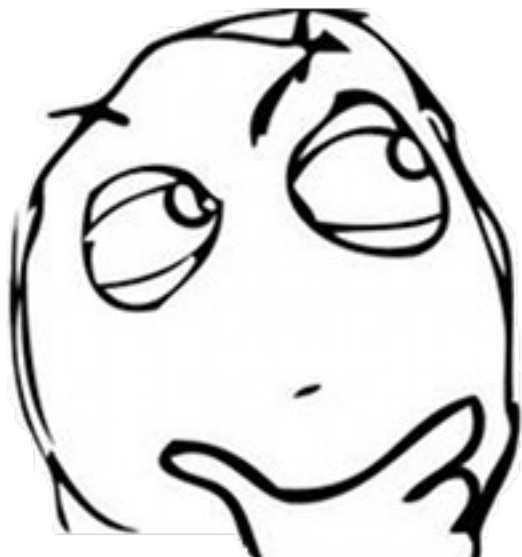
CHALLENGE ACCEPTED



COMPUTER



Y U NO UNDERSTAND ENGLISH



- Character
- Plot
- Conflict
- Structure
- Setting
- Theme
- Motif
- Style
- Imagery
- Symbolism
- Dialogue
- Perspective

- Words



What comes after what?

Professor...

•McGonagall	28.5%
•Trelawney	8.9%
•Umbridge	8.7%
•Dumbledore	5.9%
•Lupin	5.8%
•Snape	4.6%
•Flitwick	3.9%
•Sprout	3.3%

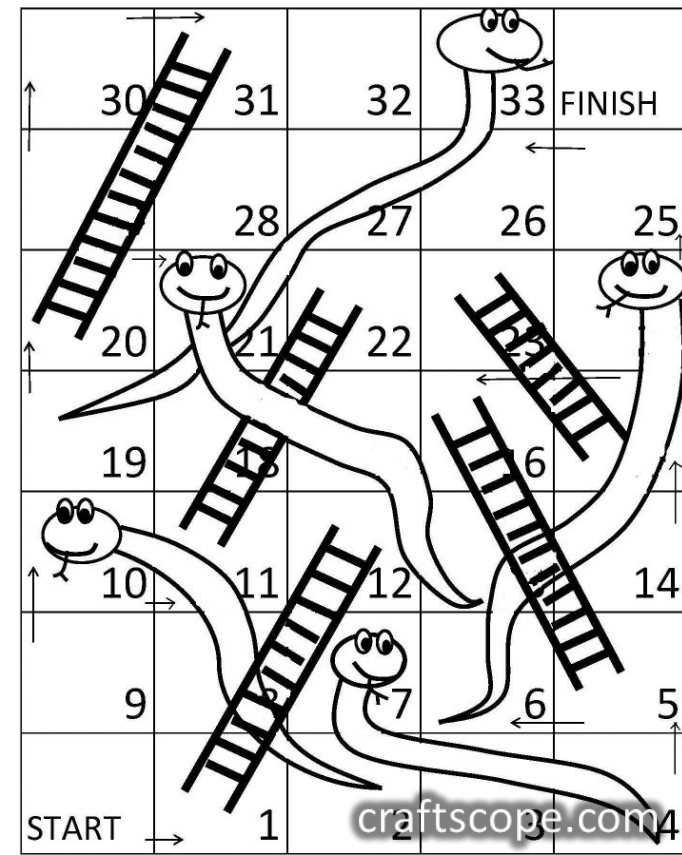
from ...

•the	31.1%
•his	6.1%
•a	3.1%
•behind	2.9%
•him	2.5%
•her	2.4%
•under	1.6%
•their	1.6%

Professor Dumbledore knew something
extremely odd stuff I'm going to feed
the lake and Lies "Isn't it?"



Markov chain
(the next thing you do depends
only on the last few things you
did)
(in other words, you *forget*
where you were before)



Longer phrases, up to a limit

Professor McGonagall...

- was 5.5%
- and 4.2%
- had 3.4%
- said 2.7%

McGonagall was...

- now 6.1%
- hurrying 6.1%
- looking 6.1%
- right 6.1%

Professor Flitwick burst into flames and curled up, purring deeply. The common room emptied as people drifted off to bed. he went into the thick black trees.

Harry Potter and the Wide-Screen



This is actually useful!

Applications

- Polymer formation
- Cell behavior
- Statistical mechanics
- Financial modeling
- Societal evolution
- Data compression
- Music

Hidden Markov models

- Cryptography
- Error correction
- Speech recognition
- Computer vision
- Machine translation
- Fraud detection
- Pattern recognition

Google PageRank

- Internet contains N web pages
- Page contains k links
- Follow a link or type a URL
- Model as a Markov chain
- What pages do users end up on?
- Higher ad prices, earlier search results

Markov chains:
forgetful models