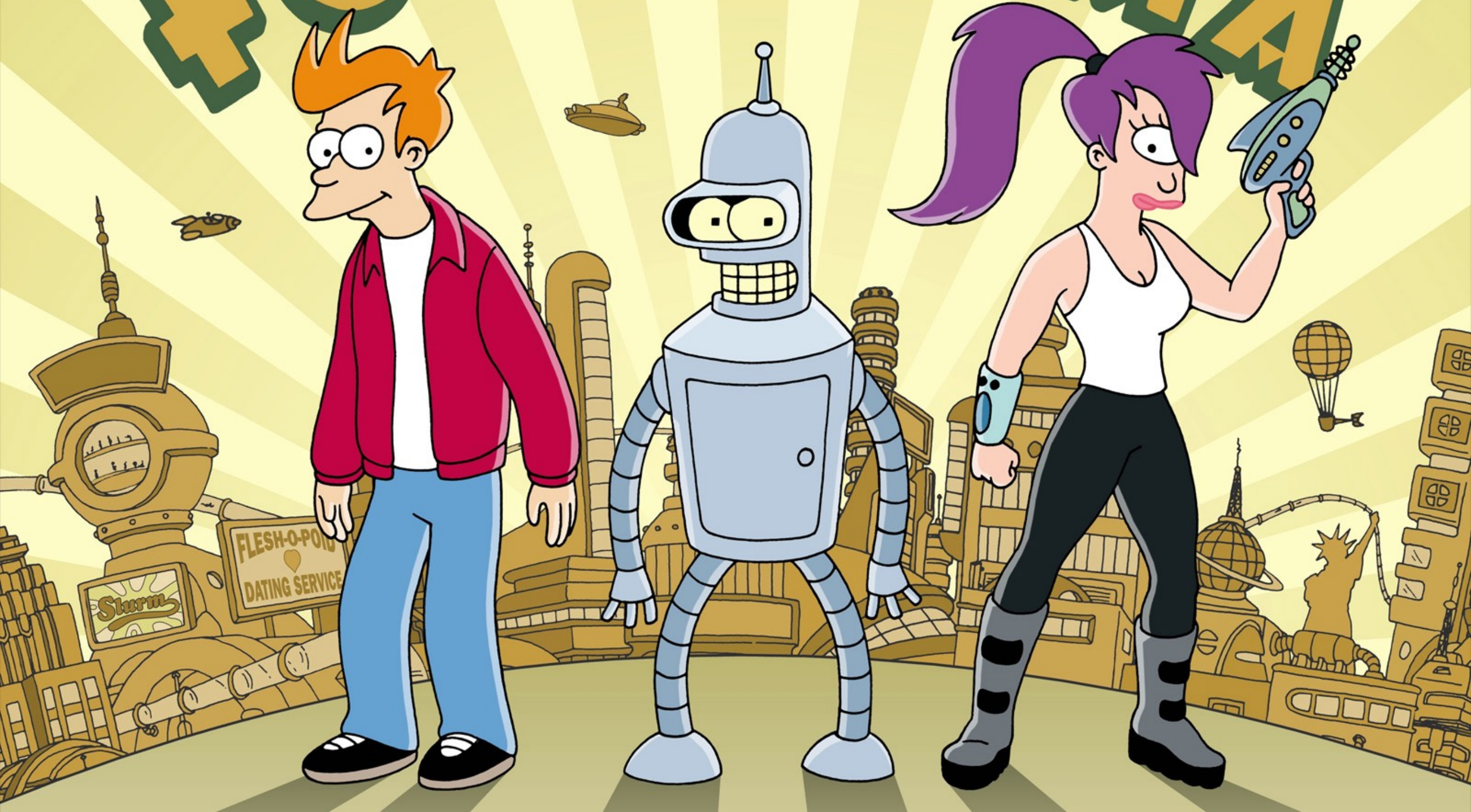


# whosaidit

A not that great dialogue attributer.



# FUTURAMA





# Futurama, the dataset

- Scraped (almost) all episode transcripts from [TheInfoSphere.org](http://TheInfoSphere.org).
- 24,034 lines of dialogue
- About 266,538 spoken words
- 1049 characters

# Futurama, the dataset

Speaker	Number of lines
Fry	3874
Bender	3627
Leela	3071
Farnsworth	1754
Zoidberg	949
Total	13275

# Futurama, the dataset

Speaker	Lines with > 3 words
Fry	2583
Bender	2562
Leela	2135
Farnsworth	1373
Zoidberg	619
Total	9272

# Naive Bayes model

"All those times I said 'Kill all humans,' I'd always whisper 'except one'. Fry was that one. [sobbing] And I never told him so!"



"time say kill human would whisper fry tell"



$$P(\text{"time"}|\text{Bender}) \times P(\text{"say"}|\text{Bender}) \times \dots P(\text{"tell"}|\text{Bender})$$

# Naive Bayes model

<b>Accuracy</b>	65.46%
<b>Precision</b>	65.57%
<b>Recall</b>	65.45%
<b>F1</b>	65.42%

Bender	243	148
Fry	119	263
	Bender	Fry

# Naive Bayes model

<b>Accuracy</b>	39.94%	Bender	154	59	93	59	28
		Farnsworth	34	88	33	40	19
		Fry	61	29	150	84	28
		Leela	48	59	76	129	29
		Zoidberg	14	14	15	14	35
<b>Precision</b>	41.11%	Bender	154	59	93	59	28
		Farnsworth	34	88	33	40	19
		Fry	61	29	150	84	28
		Leela	48	59	76	129	29
		Zoidberg	14	14	15	14	35
<b>Recall</b>	39.94%	Bender	154	59	93	59	28
		Farnsworth	34	88	33	40	19
		Fry	61	29	150	84	28
		Leela	48	59	76	129	29
		Zoidberg	14	14	15	14	35
<b>F1</b>	40.23%	Bender	154	59	93	59	28
		Farnsworth	34	88	33	40	19
		Fry	61	29	150	84	28
		Leela	48	59	76	129	29
		Zoidberg	14	14	15	14	35



Can we do better?

# Neural network model

"Alright, alright. Let me have one of your young on a roll."

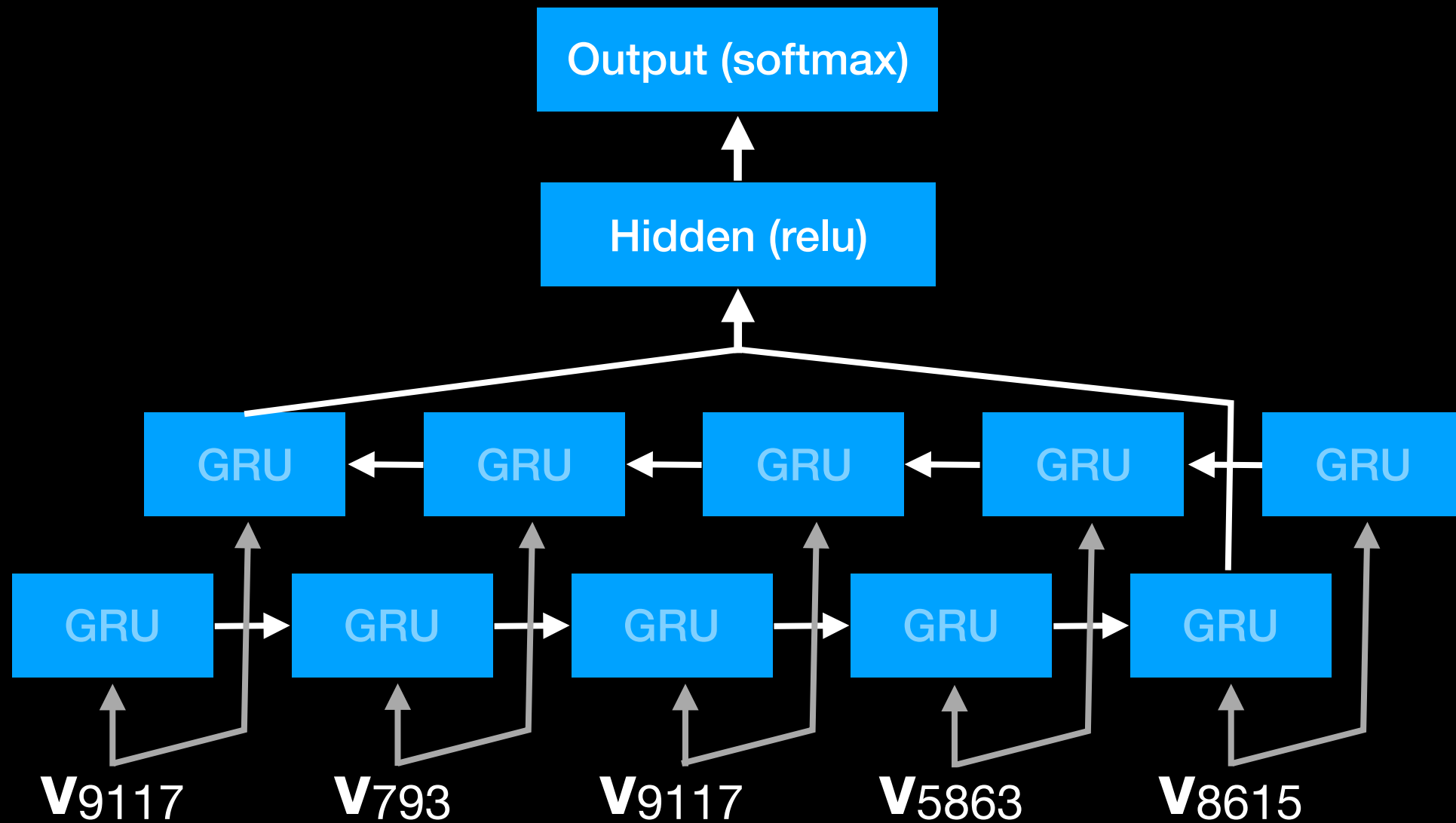


"alright , alright . let me have one of your young on a roll ."



**V**<sub>9117</sub>, **V**<sub>793</sub>, **V**<sub>9117</sub>, **V**<sub>5863</sub>, **V**<sub>8615</sub> ... **V**<sub>5863</sub>

# Neural network model



# Neural network model

<b>Accuracy</b>	41.66%	Bender	182	22	89	78	22
		Farnsworth	32	69	48	59	6
		Fry	88	17	148	86	13
		Leela	77	26	67	158	13
<b>Precision</b>	41.19%	Zoidberg	22	10	25	12	23
		Bender	182	22	89	78	22
		Farnsworth	32	69	48	59	6
		Fry	88	17	148	86	13
<b>Recall</b>	41.66%	Leela	77	26	67	158	13
		Zoidberg	22	10	25	12	23
		Bender	182	22	89	78	22
		Farnsworth	32	69	48	59	6
<b>F1</b>	41.48%	Bender	182	22	89	78	22
		Farnsworth	32	69	48	59	6
		Fry	88	17	148	86	13
		Leela	77	26	67	158	13

## Naive Bayes

Bender	154	59	93	59	28
Farnsworth	34	88	33	40	19
Fry	61	29	150	84	28
Leela	48	59	76	129	29
Zoidberg	14	14	15	14	35
	Bender	Farnsworth	Fry	Leela	Zoidberg

## Neural network

Bender	182	22	89	78	22
Farnsworth	32	69	48	59	6
Fry	88	17	148	86	13
Leela	77	26	67	158	13
Zoidberg	22	10	25	12	23
	Bender	Farnsworth	Fry	Leela	Zoidberg

Please enter some dialogue (or q to quit):



Please enter some dialogue (or q to quit): Bite my shiny metal ass!

Please enter some dialogue (or q to quit): Bite my shiny metal ass!

Input: "Bite my shiny metal ass!"

Tokens: "bite my shiny metal ass !"

Lemmas: "bite shiny metal ass"

Naive Bayes:

Bender	99.999%
Farnsworth	0.000%
Fry	0.001%
Leela	0.000%
Zoidberg	0.000%

Neural network:

Bender	97.198%
Farnsworth	0.000%
Fry	2.797%
Leela	0.005%
Zoidberg	0.000%

Please enter some dialogue (or q to quit):

Please enter some dialogue (or q to quit): Munch my sparkly bronze bum.

Please enter some dialogue (or q to quit): Munch my sparkly bronze bum.

Input: "Munch my sparkly bronze bum."

Tokens: "munch my sparkly bronze bum ."

Lemmas: "munch sparkly bronze bum"

Naive Bayes:

Bender	21.632%
Farnsworth	6.831%
Fry	7.335%
Leela	7.320%
Zoidberg	56.881%

Neural network:

Bender	93.155%
Farnsworth	0.014%
Fry	6.713%
Leela	0.073%
Zoidberg	0.046%

# Why can't we do better?

- "Wait a second. Here comes Leela."
- "Shut up, I'm billing you by the hour! Besides, I'm a robot, they'll listen to me."
- "But Mr. Mayor, that doesn't sound humane."



# Future directions

- Teaching it some basic facts about the characters.
- Better handle out of vocabulary embeddings.
- Transfer learning.
- Looking at other shows, particularly worse ones.



