

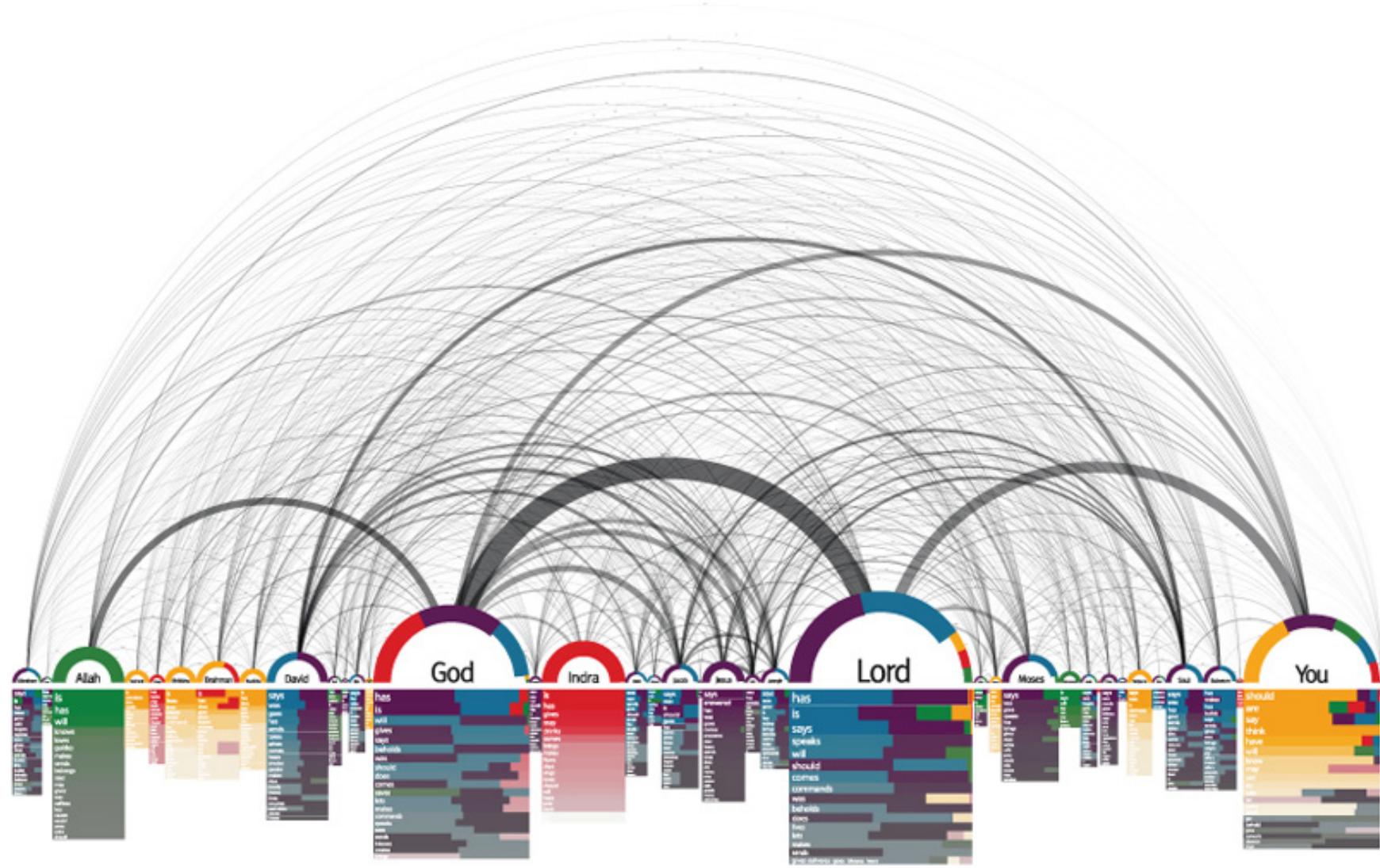
Arc Diagrams with

Gaston Sanchez
www.gastonsanchez.com

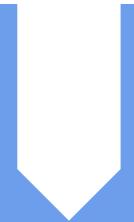


Visualization

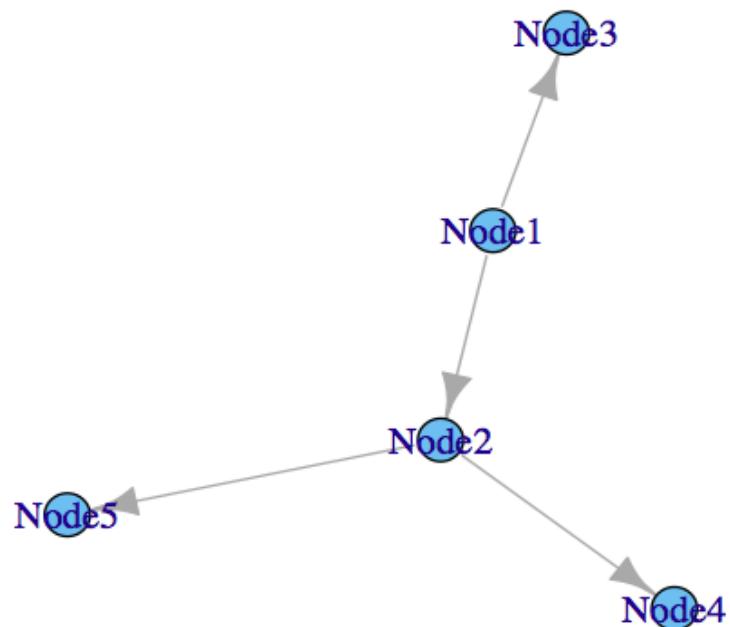




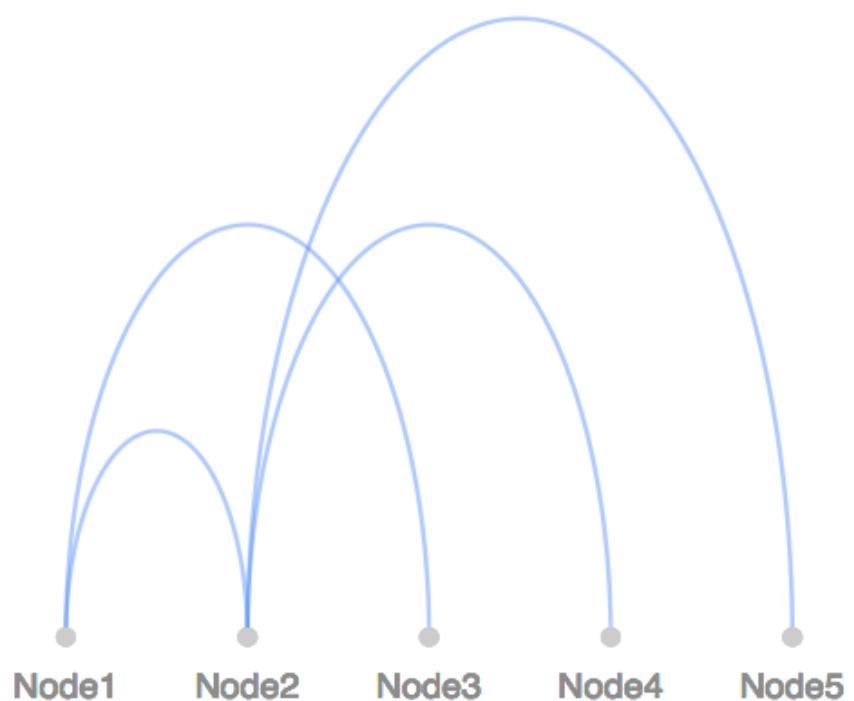
Arc Diagrams



Typical Graph
(two-dimensional)

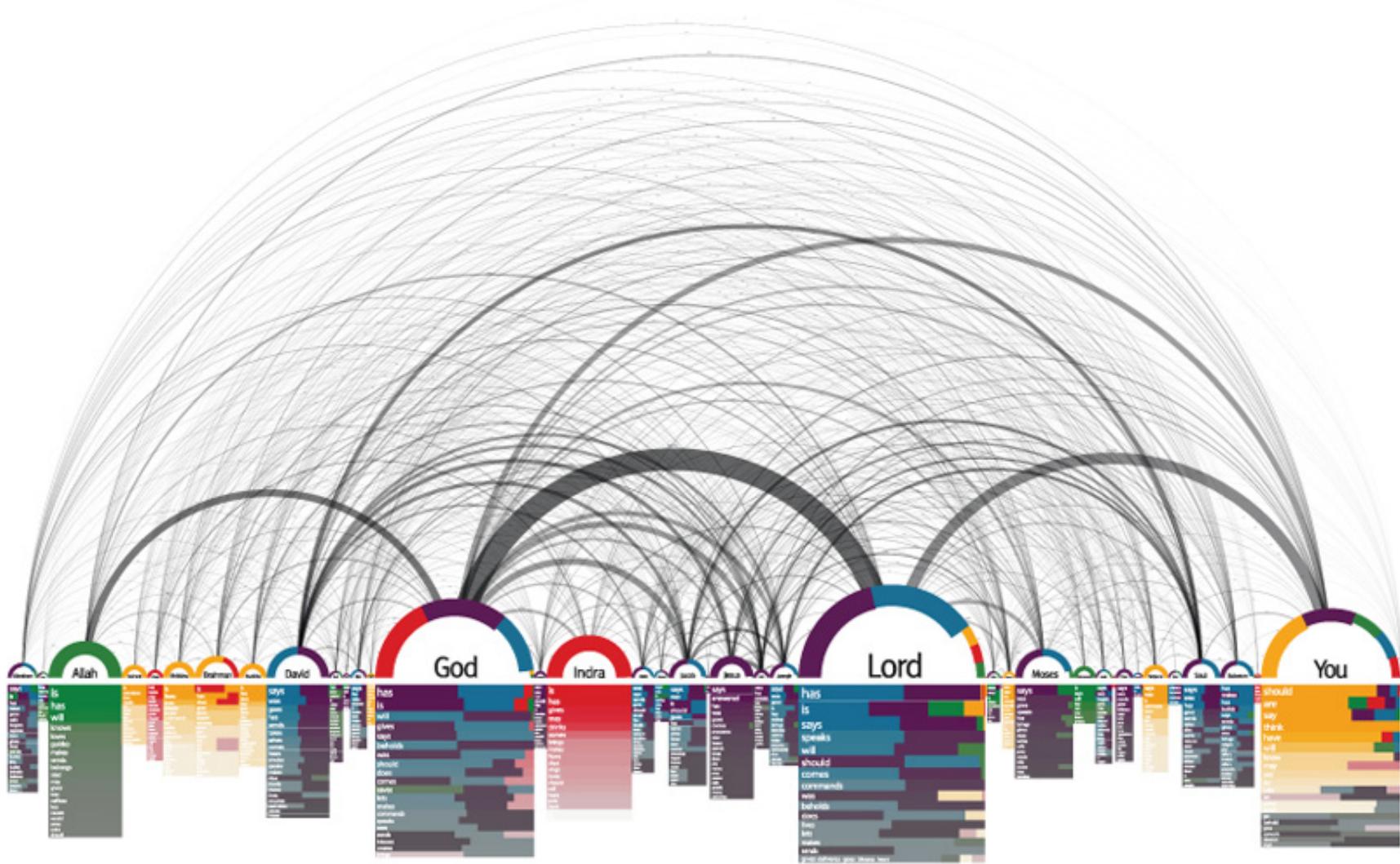


Arc Diagram
(one-dimensional)



Similar Diversity

by Philipp Steinweber and Andreas Koller



(Dis)similarities between five world religions

 Christianity

 Islam

 Hinduism

 Buddhism

 Judaism



David

God

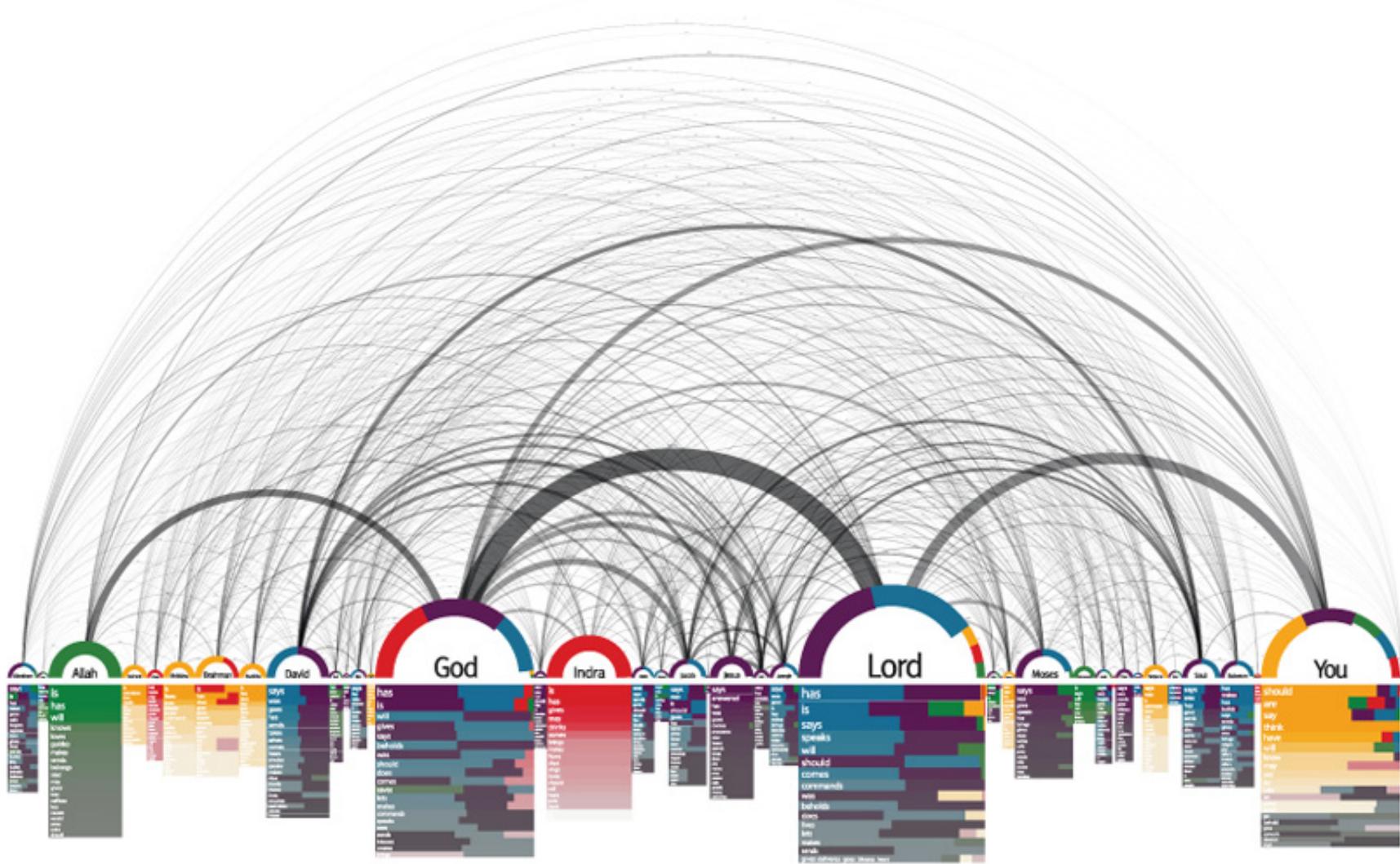
ays
as
pes
as
ends
kes
ises
omes
ears
notes
eaks
akes
ys
wells
ows
es
quires
embles
odes

has	was	says
does	will	intends
makes	is	desires
	sends	deserves
takes	does	wishes
	must	hopes
causes	wounds	speaks
troubles	reaches	should
reaches	promises	has
proposes	whispers	does
leaves	sins	heards
lets	lets	comes
opens	blinds	brings
blinds	throws	departs
throws	says	hears
		goes

has
is
will
gives
says
beholds
was
should
does
comes
saves
lets
makes
commands

Similar Diversity

by Philipp Steinweber and Andreas Koller



Similar Diversity

by Philipp Steinweber and Andreas Koller

I want to do the same....



Similar Diversity

by Philipp Steinweber and Andreas Koller

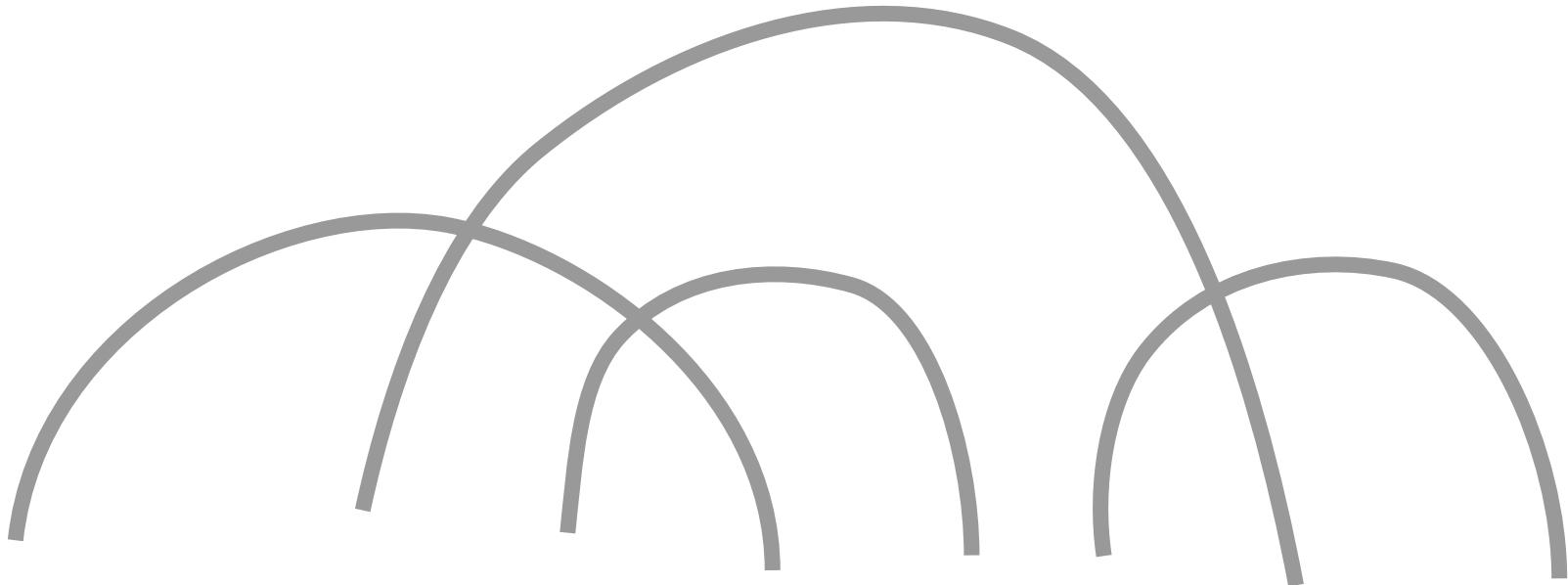
I want to do the same...

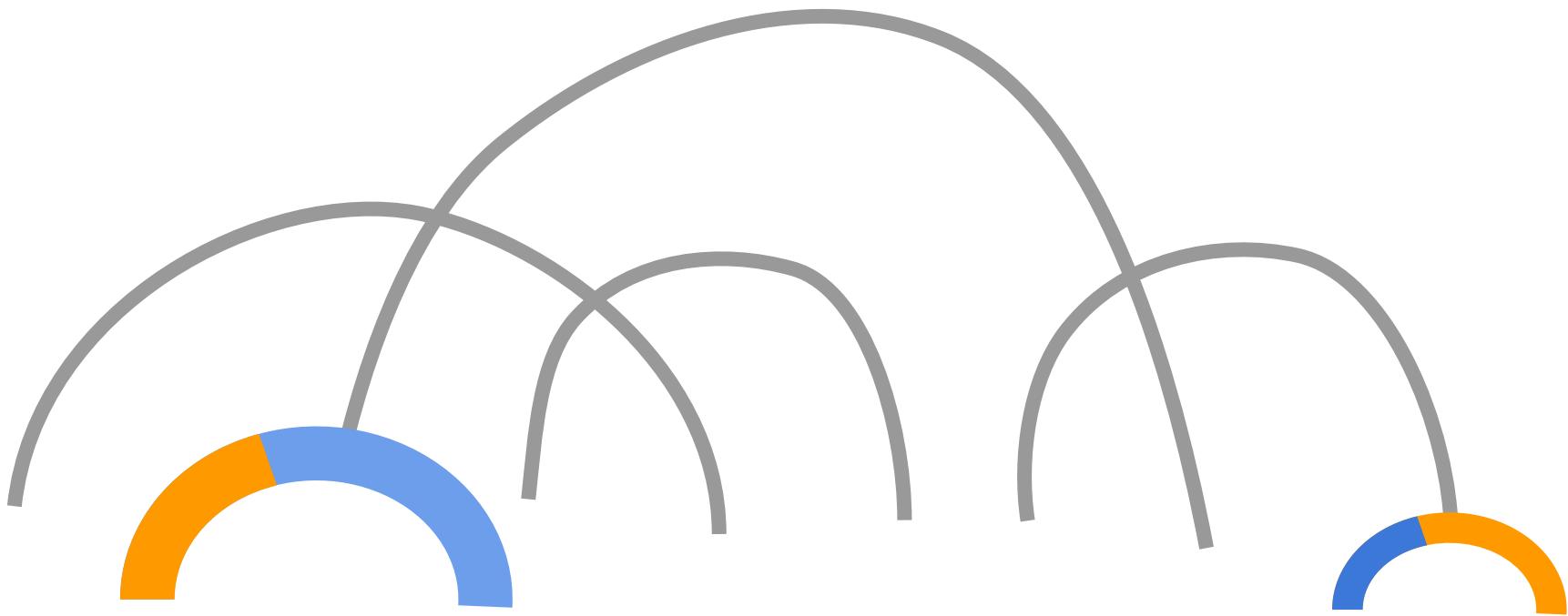
and I want to do it with R

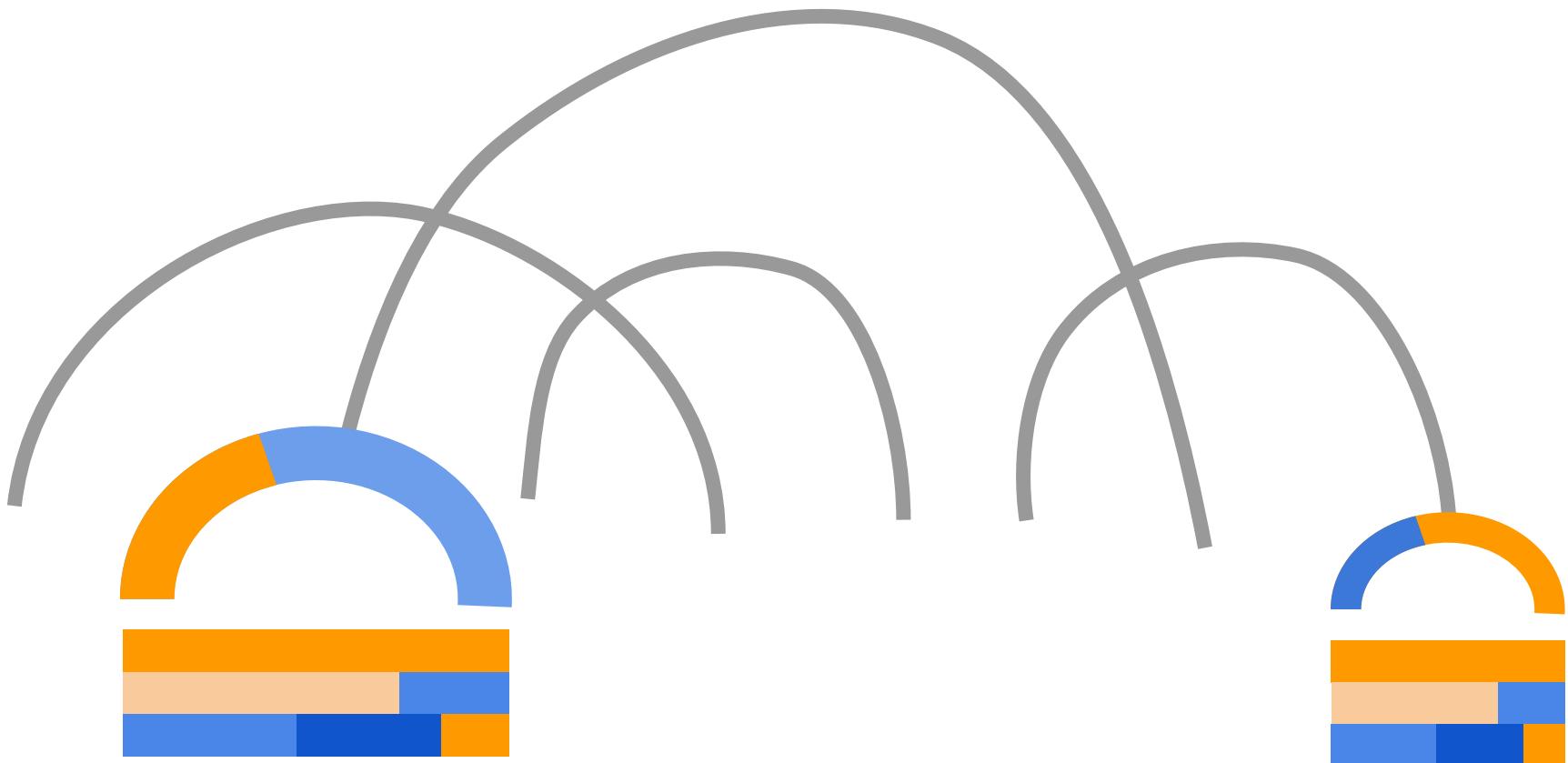


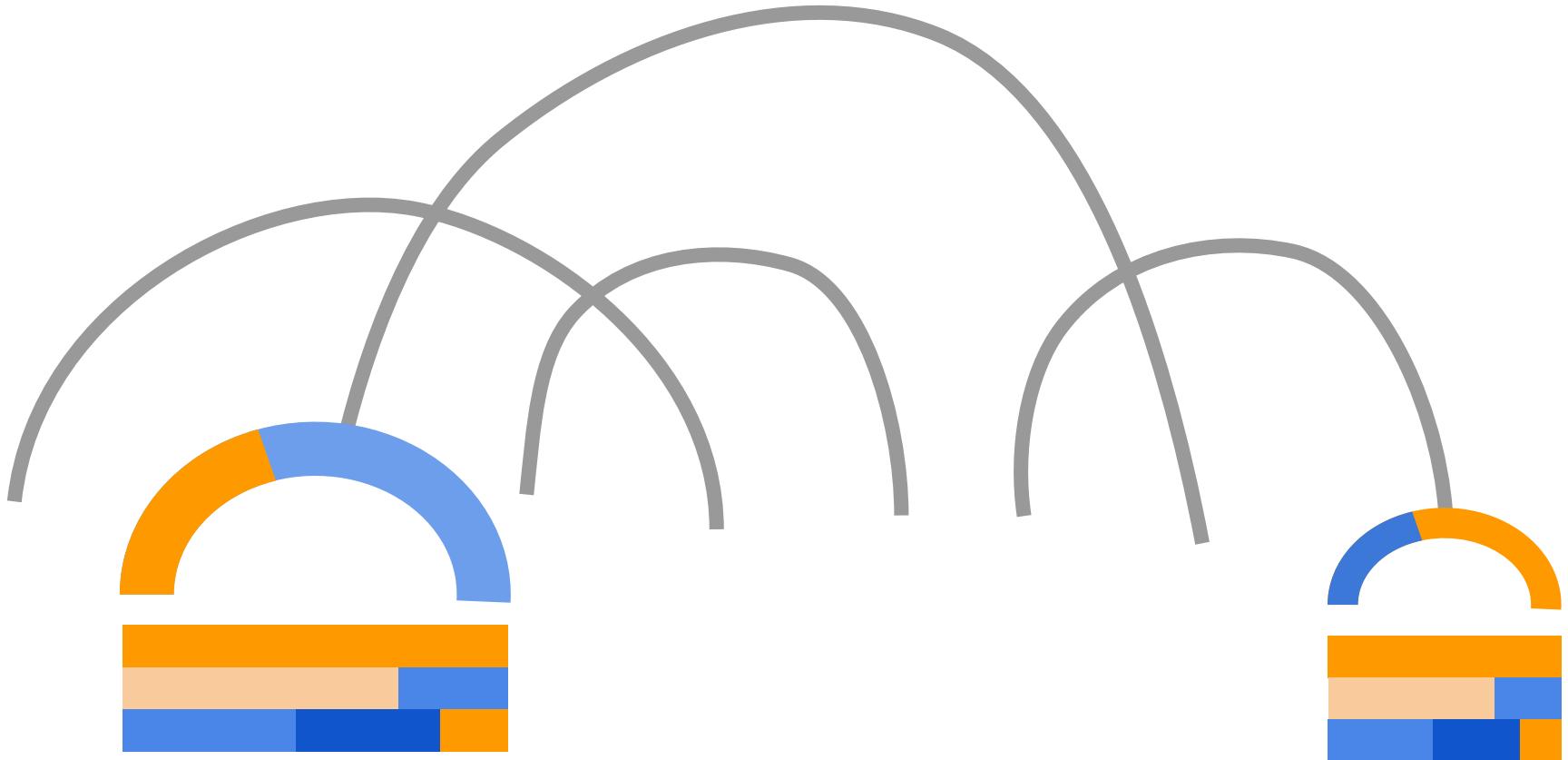
FAQs









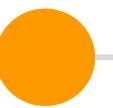


Data?

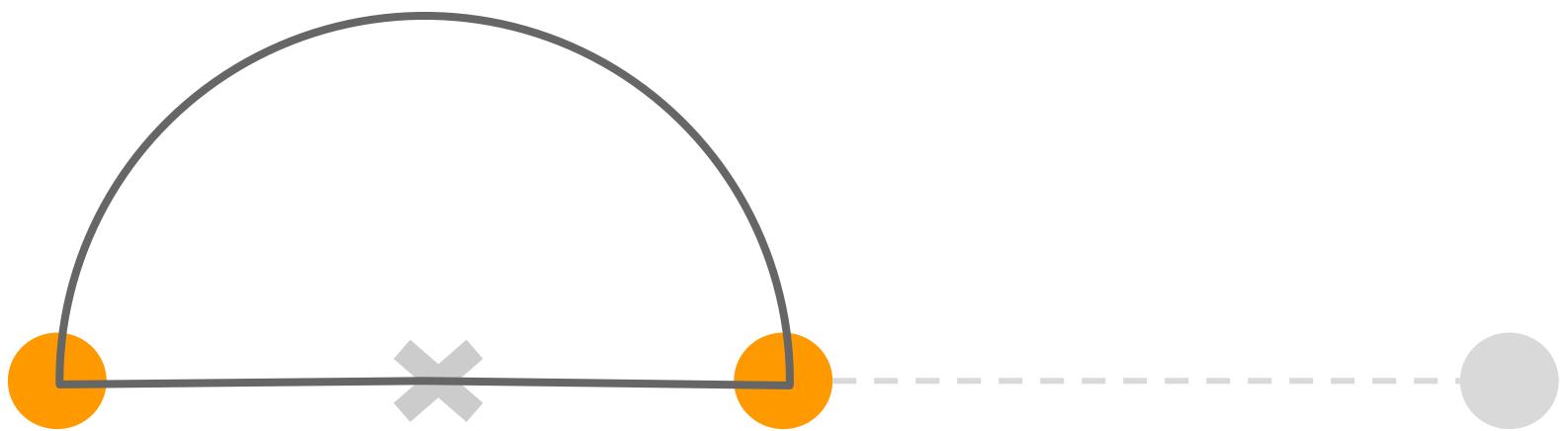
Plotting Arcs?











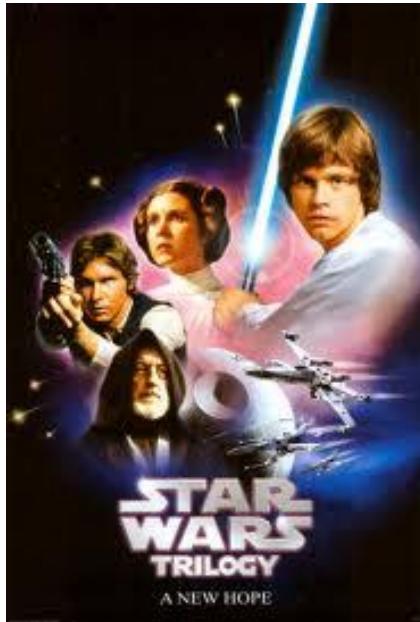
What Data?



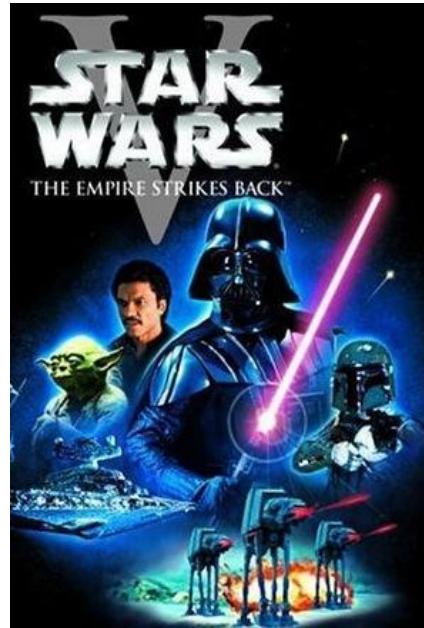
STAR WARS



Star Wars (original trilogy)



Episode IV



Episode V



Episode VI



Star Wars movie scripts

[Star Wars: A New Hope](#) (1976-01
Fourth Draft)
Written by George Lucas

[Star Wars: Attack of the Clones](#)
(2002 Draft)
Written by George Lucas

[Star Wars: Return of the Jedi](#) (1981-
12 Draft)
*Written by George Lucas, Lawrence
Kasdan*

[Star Wars: Revenge of the Sith](#)
(Undated Draft)
Written by George Lucas

[Star Wars: The Empire Strikes Back](#)
(Undated Draft)
*Written by George Lucas, Lawrence
Kasdan, Leigh Brackett*

[Star Wars: The Phantom Menace](#)
(1999 Draft)
Written by George Lucas

STAR WARS

Episode V

THE EMPIRE STRIKES BACK

Script adaptation by
Lawrence Kasdan and Leigh Brackett
from a story by
George Lucas

LUCASFILM LTD.

A long time ago, in a galaxy far, far, away...

It is a dark time for the Rebellion. Although the Death Star has been destroyed, Imperial troops have driven the Rebel forces from their hidden base and pursued them across the galaxy.

Evading the dreaded Imperial Starfleet, a group of freedom fighters led by Luke Skywalker has established a new secret base on the remote ice world of Hoth.

The evil lord Darth Vader, obsessed with finding young Skywalker, has dispatched thousands of remote probes into the far reaches of space...

Parsing Scripts



LUKE: (into comlink) Echo Three to Echo Seven.
Han, old buddy, do you read me?

After a little static a familiar voice
is heard.

HAN: (over comlink) Loud and clear, kid. What's
up?

LUKE: (into comlink) Well, I finished my circle. I
don't pick up any life readings.

HAN: (over comlink) There isn't enough life on
this ice cube to fill a space cruiser. The sensors
are placed. I'm going back.

LUKE: (into comlink) Echo Three to Echo Seven.
Han, old buddy, do you read me?

After a little static a familiar voice
is heard.

HAN: (over comlink) Loud and clear, kid. What's
up?

LUKE: (into comlink) Well, I finished my circle. I
don't pick up any life readings.

HAN: (over comlink) There isn't enough life on
this ice cube to fill a space cruiser. The sensors
are placed. I'm going back.

LUKE: (into comlink) Echo Three to Echo Seven.
Han, old buddy, do you read me?

After a little static a familiar voice
is heard.

HAN: (over comlink) Loud and clear, kid. What's
up?

LUKE: (into comlink) Well, I finished my circle. I
don't pick up any life readings.

HAN: (over comlink) There isn't enough life on
this ice cube to fill a space cruiser. The sensors
are placed. I'm going back.

LUKE: (into comlink) Echo Three to Echo Seven.
Han, old buddy, do you read me?

After a little static a familiar voice
is heard.

HAN: (over comlink) Loud and clear, kid. What's up?

LUKE: (into comlink) Well, I finished my circle. I don't pick up any life readings.

HAN: (over comlink) There isn't enough life on this ice cube to fill a space cruiser. The sensors are placed. I'm going back.

LUKE: (into comlink) Echo Three to Echo Seven.
Han, old buddy, do you read me?

After a little static a familiar voice
is heard.

HAN: (over comlink) Loud and clear, kid. What's
up?

LUKE: (into comlink) Well, I finished my circle. I
don't pick up any life readings.

HAN: (over comlink) There isn't enough life on
this ice cube to fill a space cruiser. The sensors
are placed. I'm going back.

Top Characters





LUKE



LEIA



THREEPPIO



HAN



VADER



YODA



BEN



EMPEROR



LANDO



JABBA



ACKBAR



OWEN



PIETT



TARKIN



TROOPER



GOLD LEADER



RED LEADER

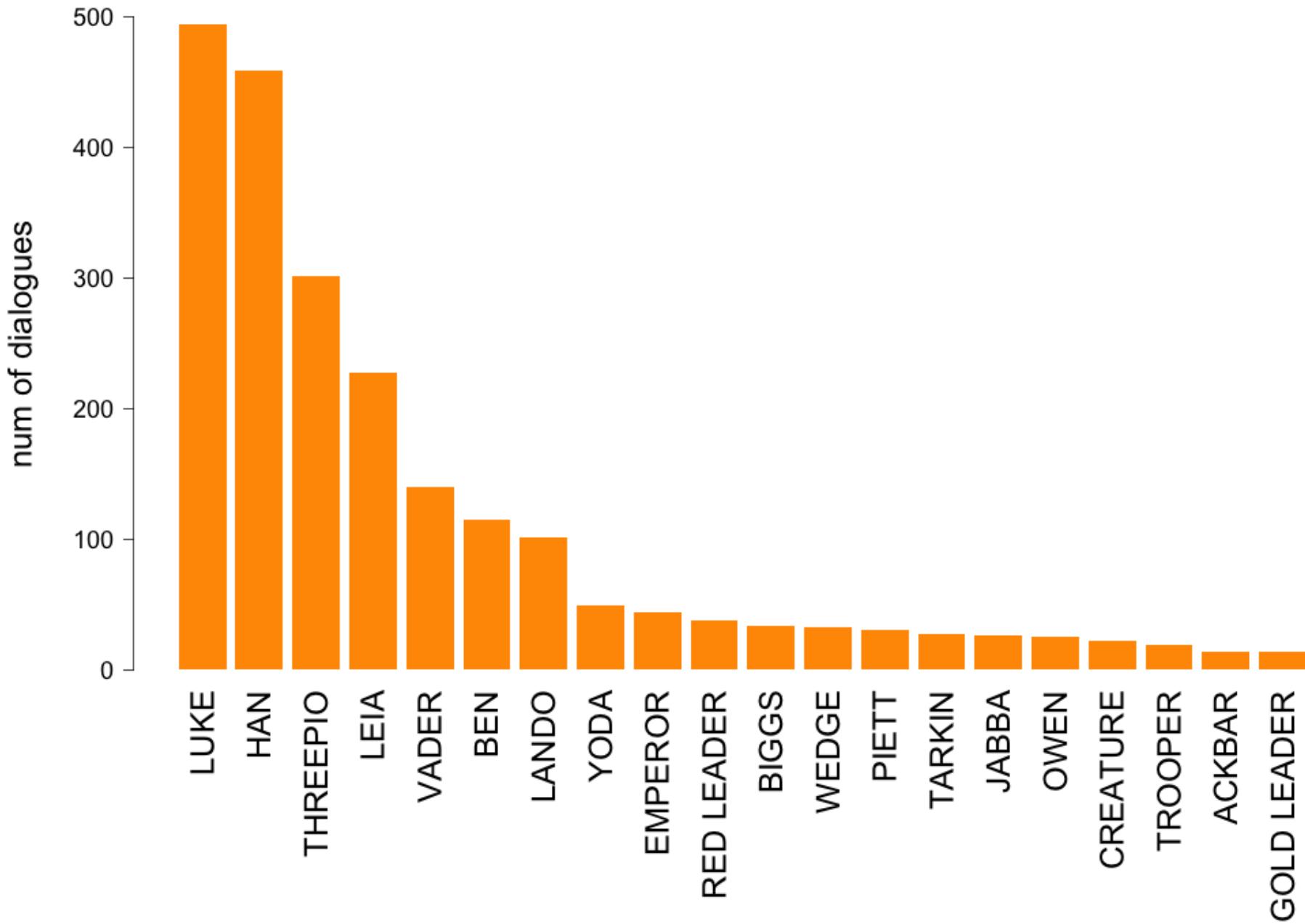


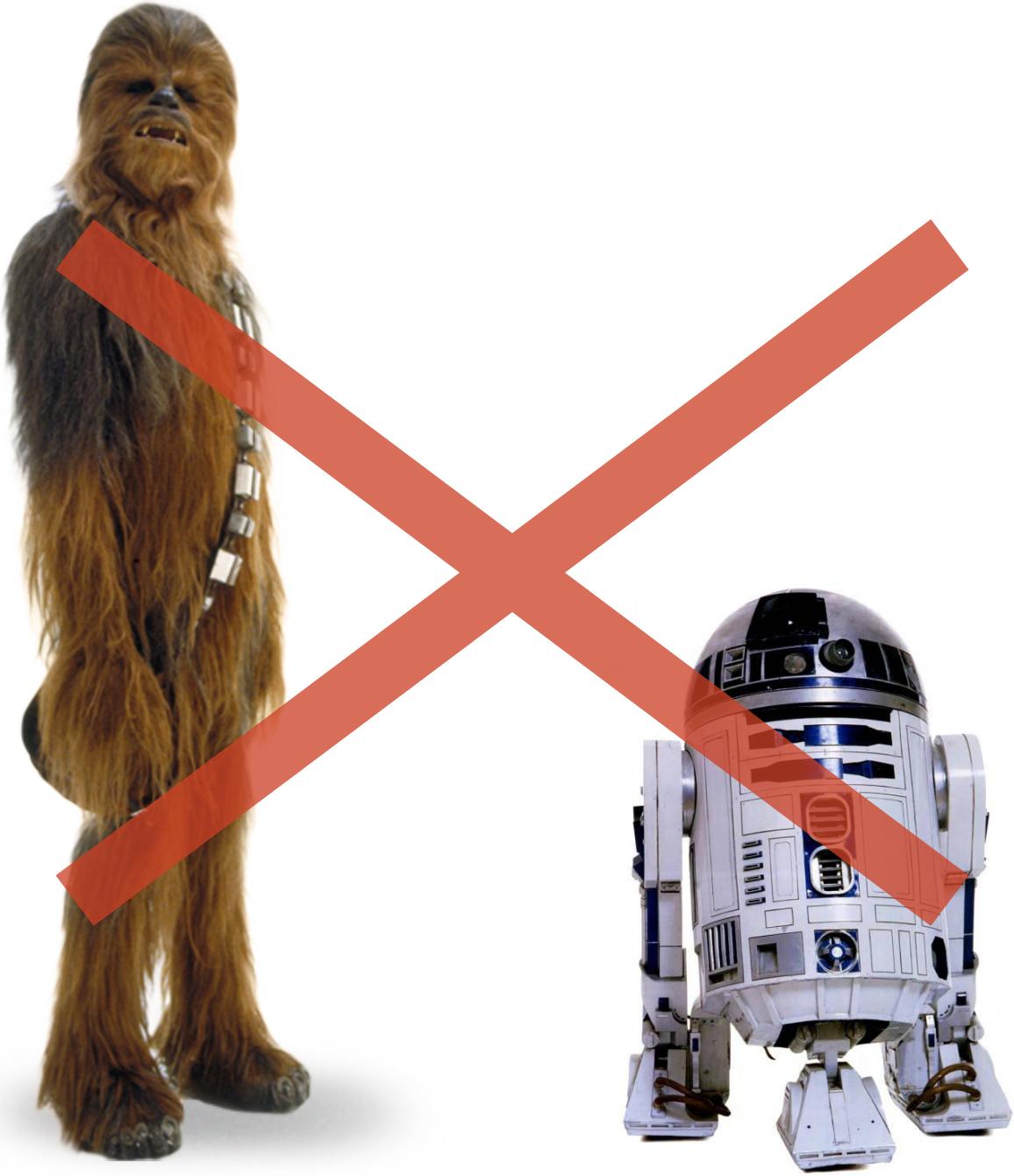
BIGGS



WEDGE

Top 20 most talkative characters (Episodes IV, V, VI)





Number of dialogues per episode

Character	Episode IV	Episode V	Episode VI
LUKE	254	128	112
HAN	153	182	124
THREEPIO	119	92	90
LEIA	57	114	56
VADER	41	56	43
BEN	82	15	18
LANDO	0	61	40
YODA	0	36	13
EMPEROR	0	5	39
RED LEADER	37	0	1
BIGGS	34	0	0
WEDGE	14	8	11
PIETT	0	23	8
TARKIN	28	0	0
JABBA	6	0	20
OWEN	25	0	0
CREATURE	1	21	0
TROOPER	19	0	0
ACKBAR	0	0	14
GOLD LEADER	14	0	0

Text Mining



R package **tm**

ACKBAR



You can see here the Death Star orbiting the forest Moon of Endor. Although the weapon systems on this Death Star are not yet operational, the Death Star does have a strong defense mechanism. It is protected by an energy shield...

BEN



Hello there! Come here my little friend. Don't be afraid. Don't worry, he'll be all right. Rest easy, son, you've had a busy day. You're fortunate you're still in one piece. The Jundland Wastes are not to be traveled lightly. Tell me, young Luke, what brings ...

YODA



Hmmm. Much anger in him, like his father. Hah. He is not ready. Ready, are you? What know you of ready? For eight hundred years have I trained Jedi. My own counsel will I keep on who is to be trained! A Jedi must have the deepest commitment...

who

what he says

how many times
(per episode)

	char	term	epIV	epV	epVI
1	LUKE	know	17	10	7
2	LUKE	going	25	7	0
3	LUKE	right	20	10	0
4	LUKE	come	18	0	8
5	LUKE	back	17	0	7
6	LUKE	can	15	0	6
7	LUKE	just	13	8	0
8	LUKE	well	19	0	0
9	LUKE	got	17	0	0
10	LUKE	father	0	0	16

Document Term Matrix

Docs	Terms						
	abide	abilities	ability	able	aboard	absolutely	academy
ACKBAR	0	0	0	0	0	0	0
BEN	0	1	0	1	0	0	0
BIGGS	0	0	0	1	2	0	2
CREATURE	0	0	0	0	0	0	0
EMPEROR	0	0	0	0	0	0	0
GOLD LEADER	0	0	0	0	0	0	0
HAN	0	0	0	1	1	1	0
JABBA	0	0	0	1	0	0	0
LANDO	0	0	0	1	0	1	0
LEIA	0	0	0	0	0	0	0
LUKE	0	0	0	0	0	0	3
OWEN	0	0	0	1	0	0	1
PIETT	0	0	0	0	0	0	0
RED LEADER	0	0	0	0	0	0	0
TARKIN	0	0	0	0	1	0	0
THREEPIO	1	0	0	1	0	0	0
TROOPER	0	0	0	0	0	0	0
VADER	0	0	1	0	1	0	0
WEDGE	0	0	0	0	0	0	0
YODA	0	0	0	0	0	0	0

Graph



R package **igraph**

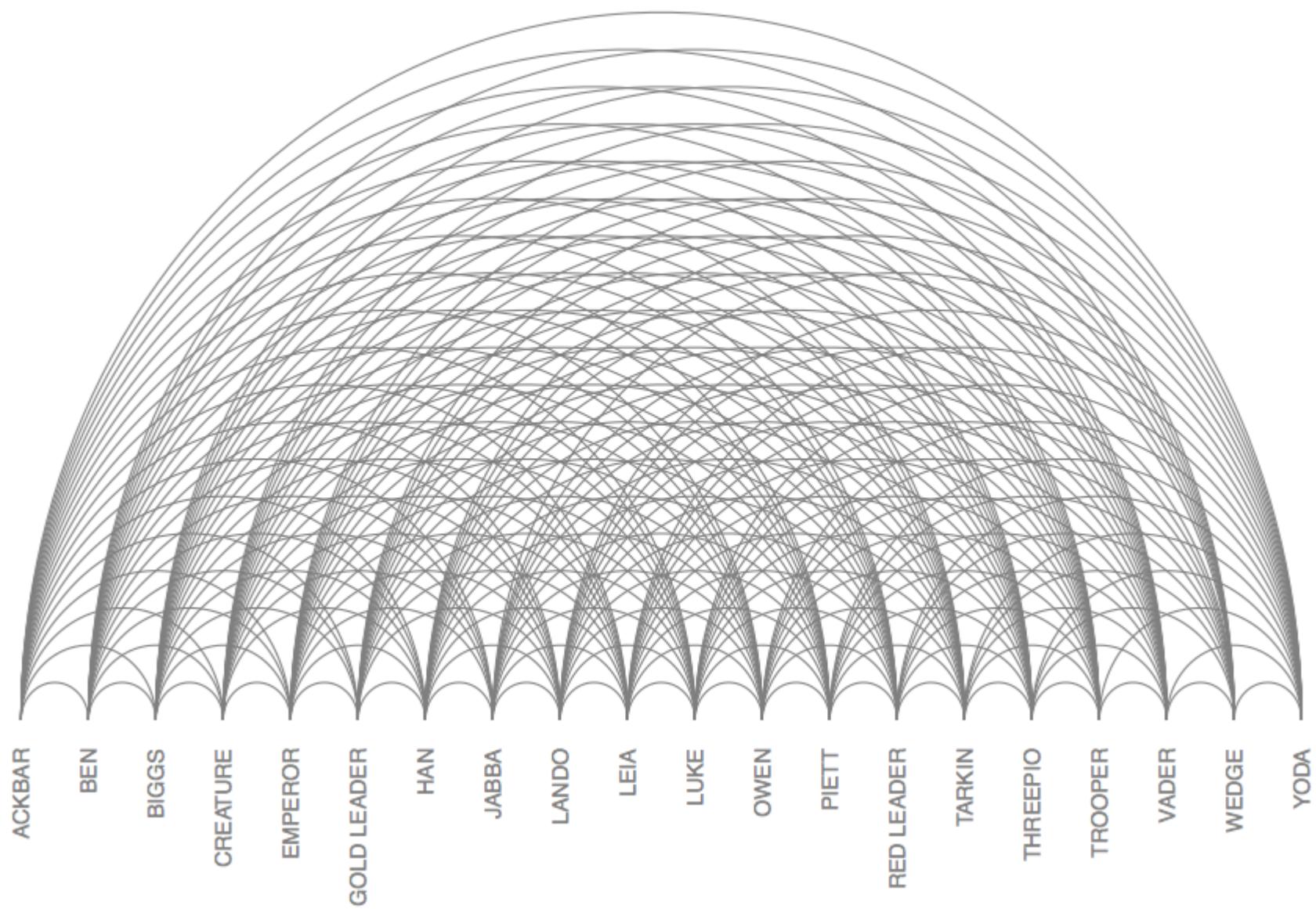
Adjacency Matrix

Docs	Docs									
Docs	ACKBAR	BEN	BIGGS	CREATURE	EMPEROR	GOLD	LEADER	HAN	JABBA	LANDO
ACKBAR	0	89	20	10	76		8	223	15	118
BEN	89	0	643	312	957		30	2928	214	661
BIGGS	20	643	0	59	177		20	1790	51	301
CREATURE	10	312	59	0	201		4	529	56	96
EMPEROR	76	957	177	201	0		16	1039	194	319
GOLD LEADER	8	30	20	4	16		0	116	4	37
HAN	223	2928	1790	529	1039		116	0	379	2727
JABBA	15	214	51	56	194		4	379	0	139
LANDO	118	661	301	96	319		37	2727	139	0
LEIA	115	1394	650	209	582		38	4587	184	857
LUKE	184	3731	1660	630	1699		134	13248	576	2612
OWEN	14	323	165	33	122		8	810	29	113
PIETT	4	130	31	28	103		5	308	9	150
RED LEADER	27	201	151	17	59		52	749	18	181
TARKIN	34	368	70	67	281		12	540	77	205
THREEPIO	131	2166	1130	329	874		137	7148	302	1323
TROOPER	9	94	37	3	24		1	320	10	109
VADER	142	1548	349	236	1068		38	2238	235	571
WEDGE	12	157	118	15	38		66	507	11	120
YODA	66	1258	190	205	783		8	1000	176	327

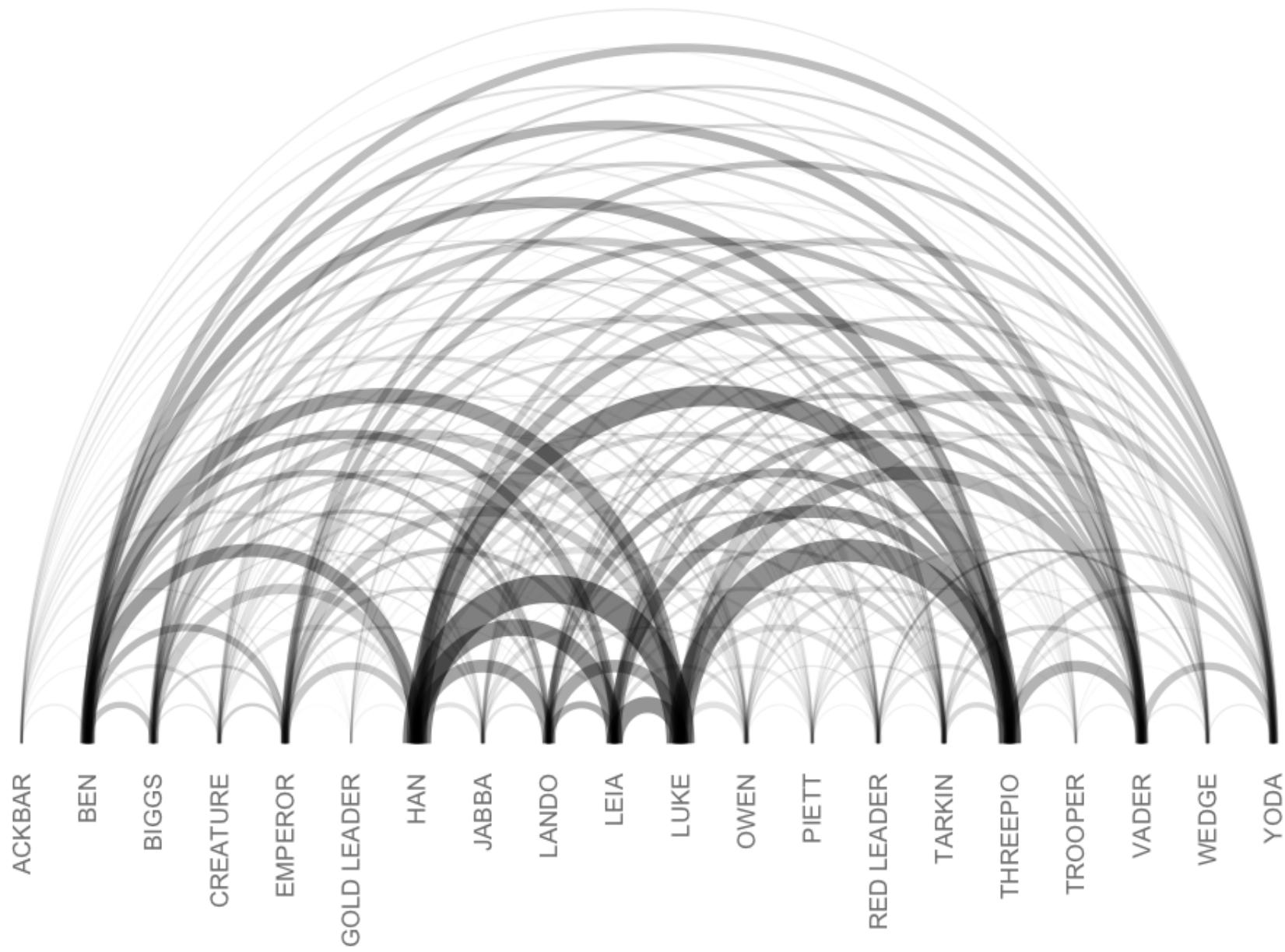
Arc Diagram



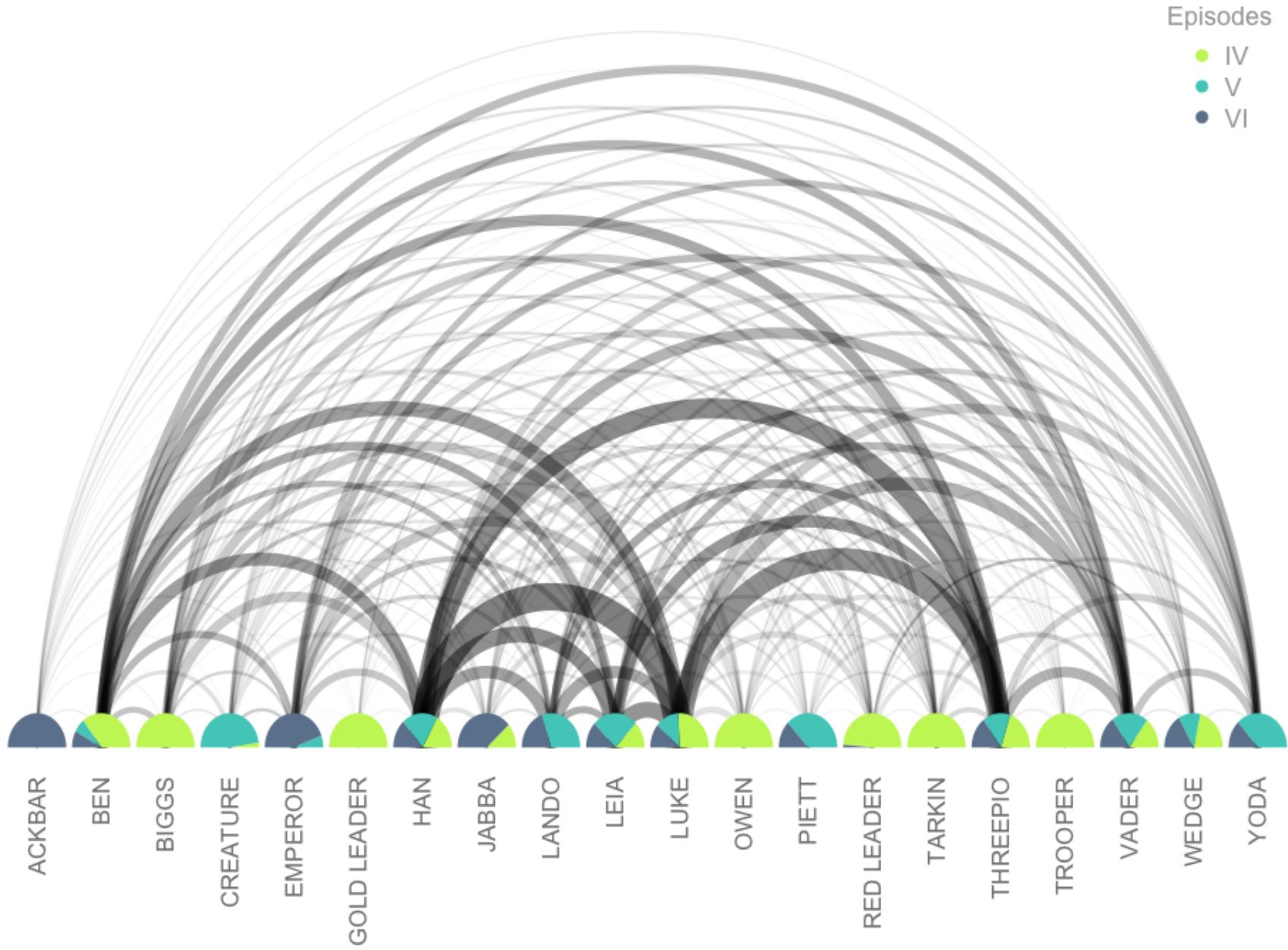
Preliminary arc–diagram



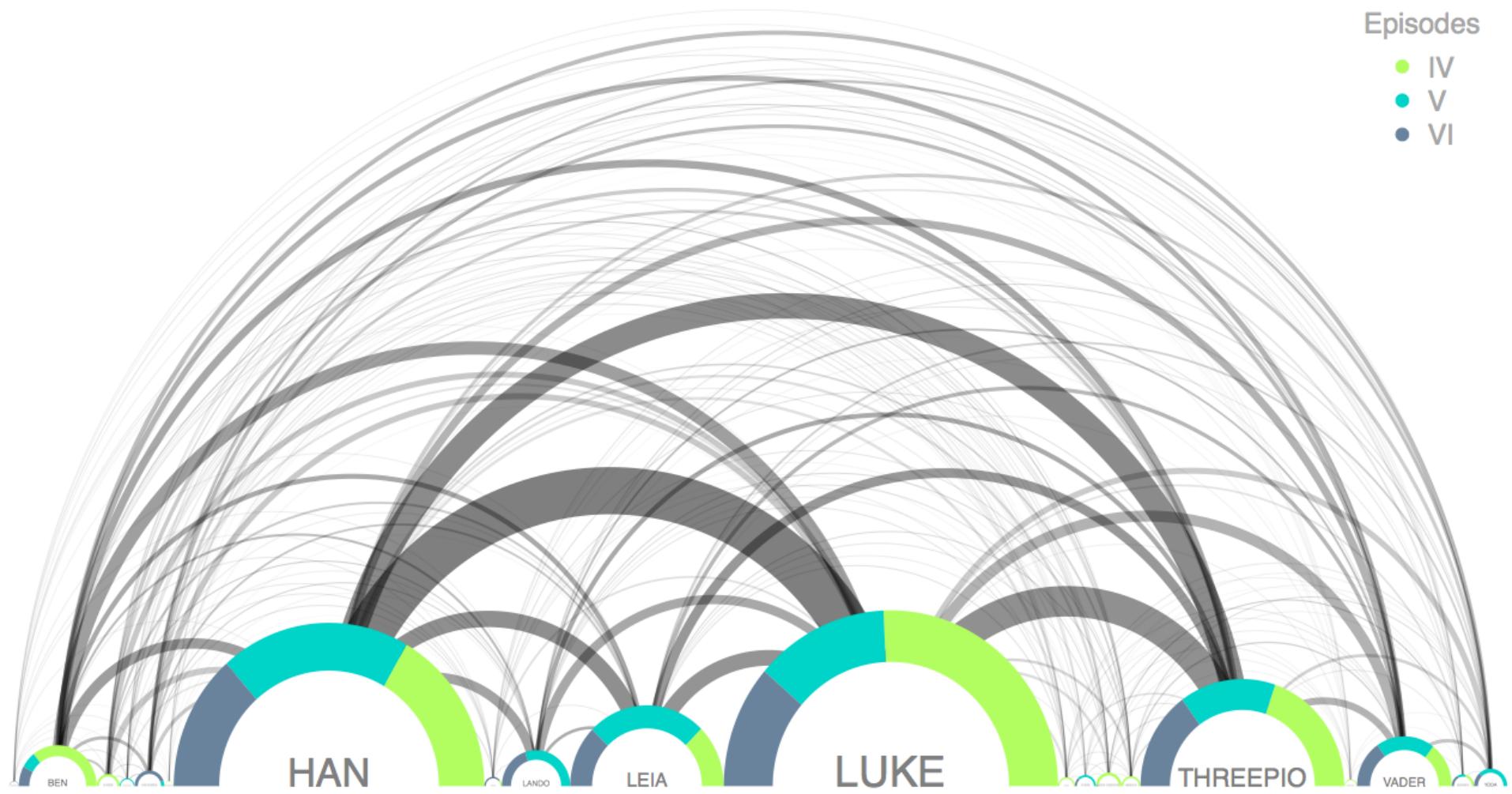
Changing arc widths



Arc-diagram with pie charts



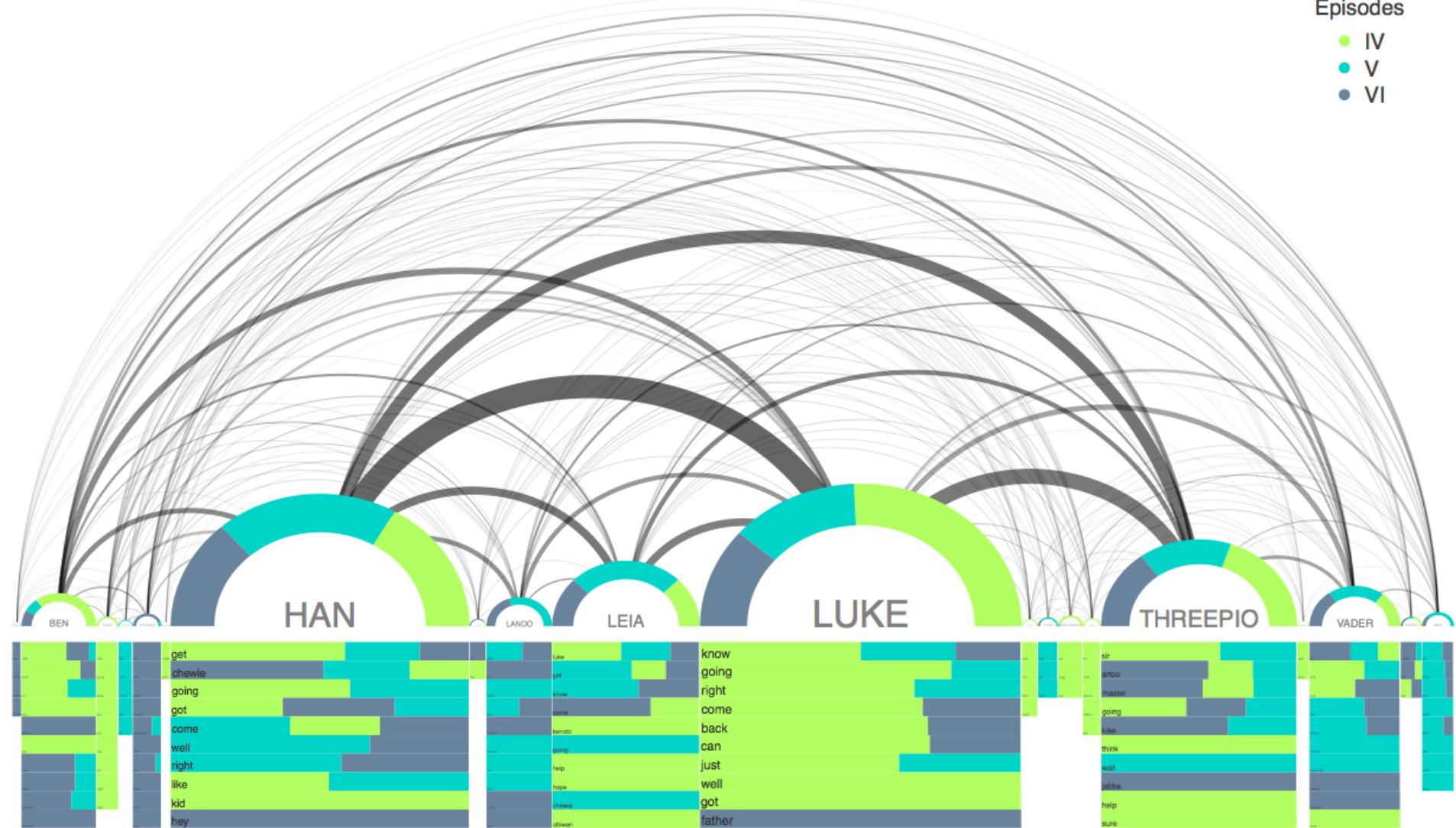
Arc-diagram with bands

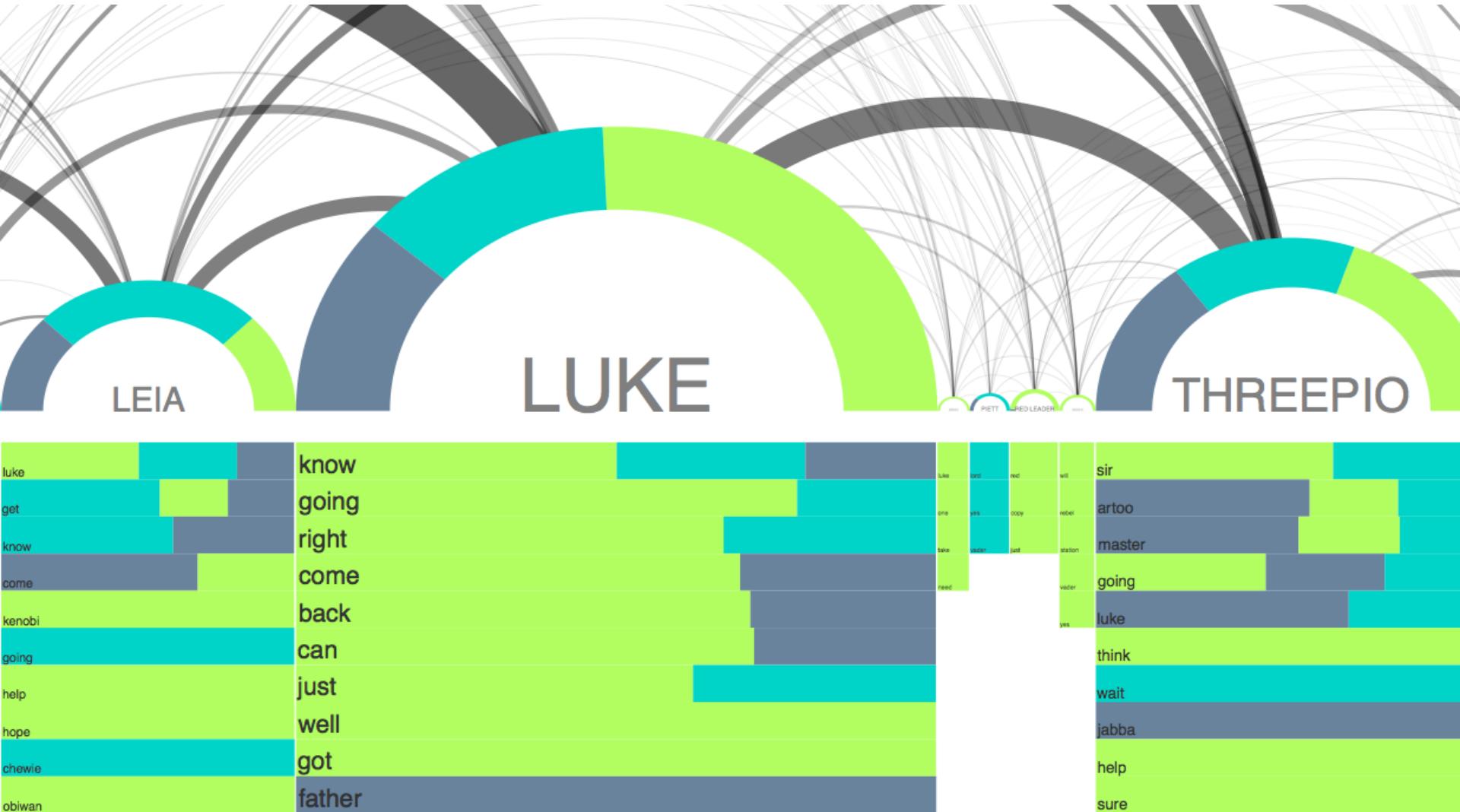


Star Wars: Character Dialogues
Arc-diagram

Episodes

- IV
- V
- VI

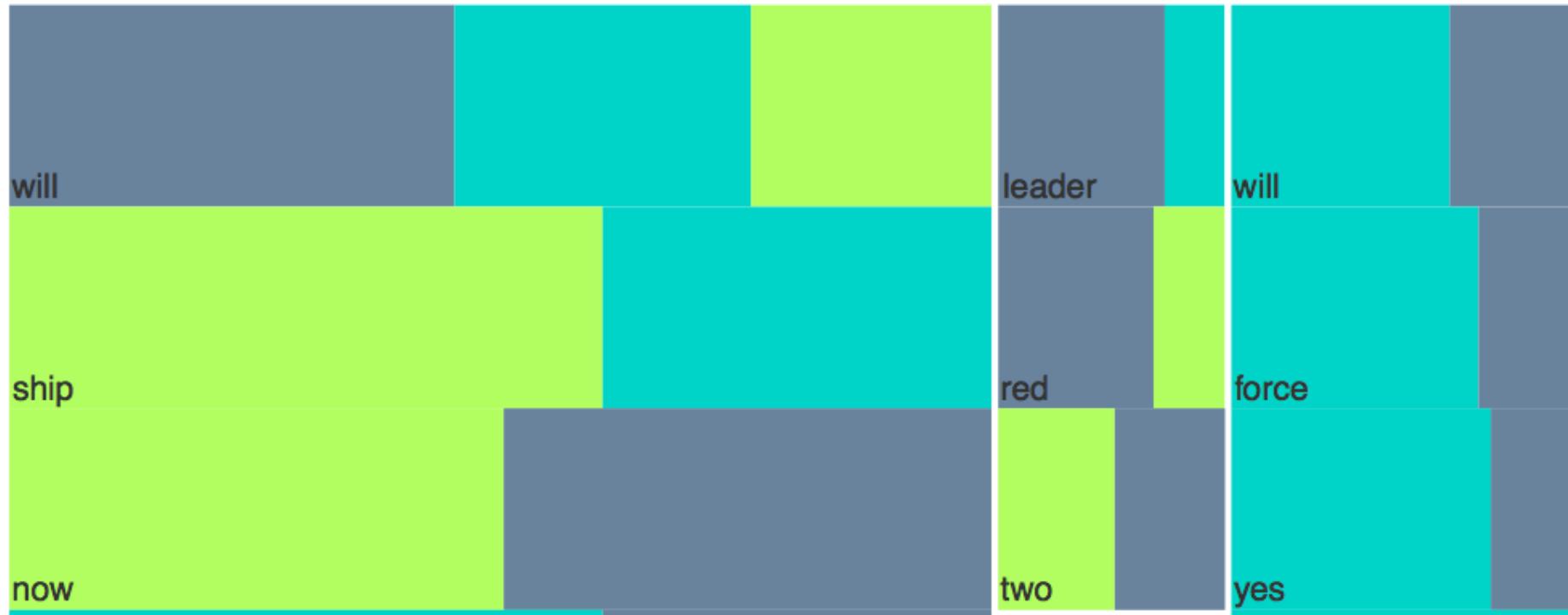




VADER

WEDGE

YODA





Code in R

<https://github.com/gastonstat/StarWars>



arcdiagram

<https://github.com/gastonstat/arcdiagram>

May the Fo^QRce
be with you

slides at

<http://bit.ly/1fwuuTo>