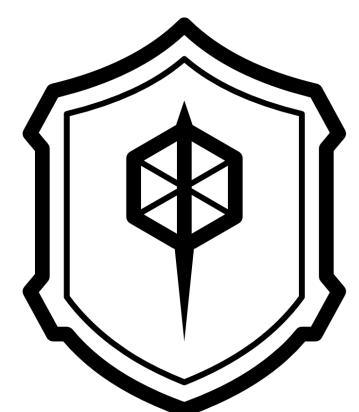


A VIZ OF ICE AND FIRE

Summarizing Entertainment Video
Using Color and Dialogue

Fred Hohman, Sandeep Soni, Ian Stewart, John Stasko

*2nd Workshop on Visualization for the Digital Humanities
Phoenix, Arizona, United States*



Polo Club
— of —
DATA SCIENCE

Georgia Tech  **Visualization Lab**



Game of Thrones is famous for its colorful ***cinematography*** and memorable ***dialogue***.



cinematography ≈ color

dialogue ≈ subtitles

Video

Video

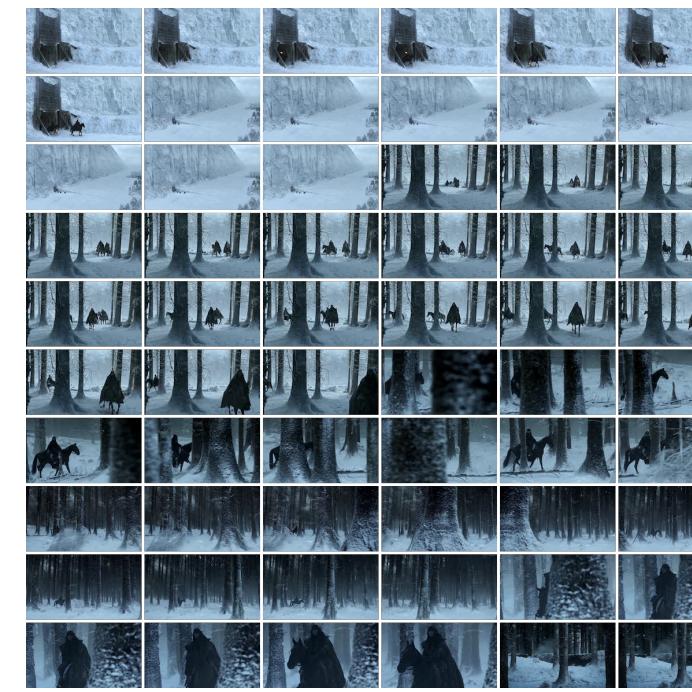
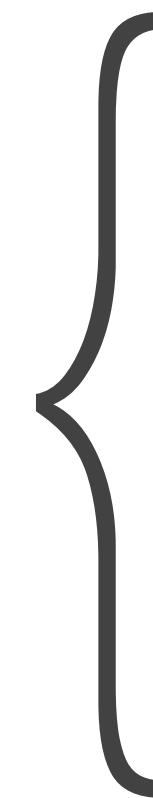


Data

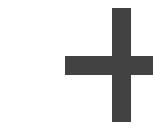
Video



Data



60 frames



*When you play the
Game of Thrones,
you win or you die.*

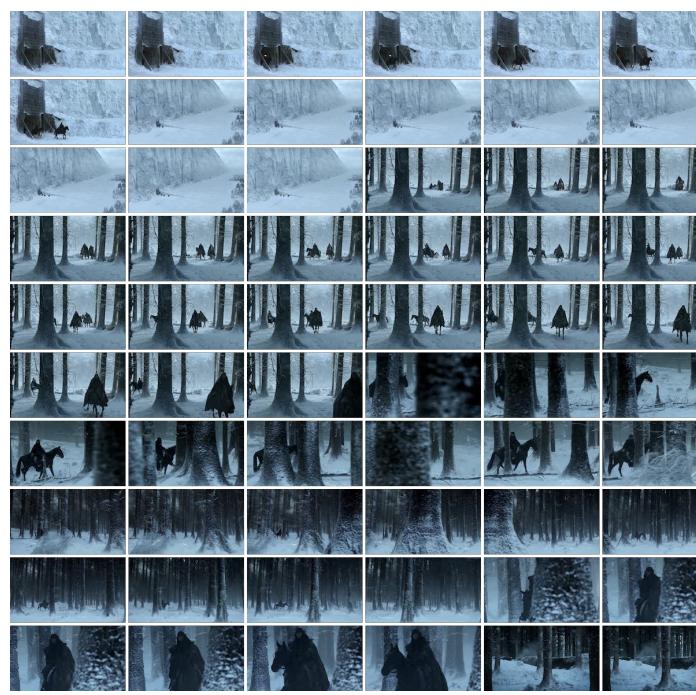
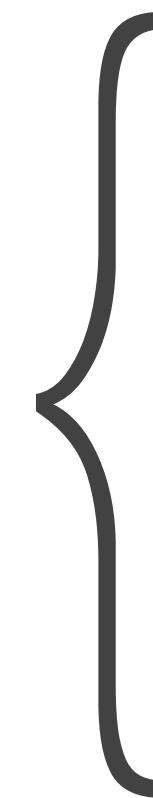
Subtitles



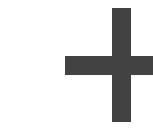
Video



Data



60 frames

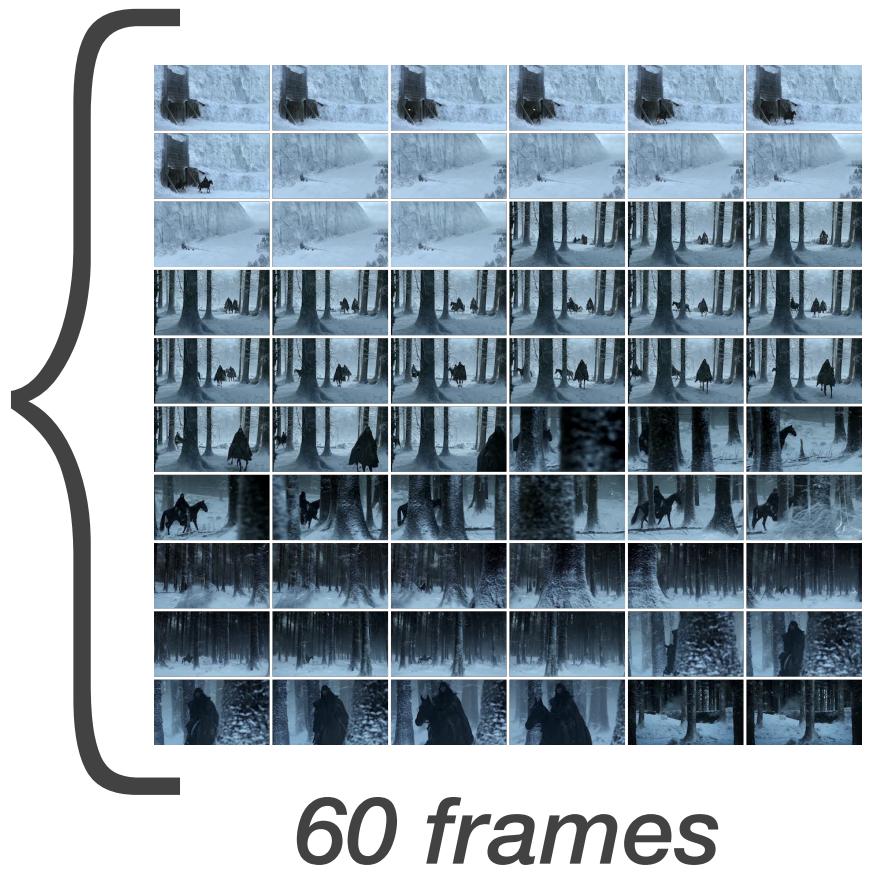


*When you play the
Game of Thrones,
you win or you die.*

Subtitles



Video



60 frames

+

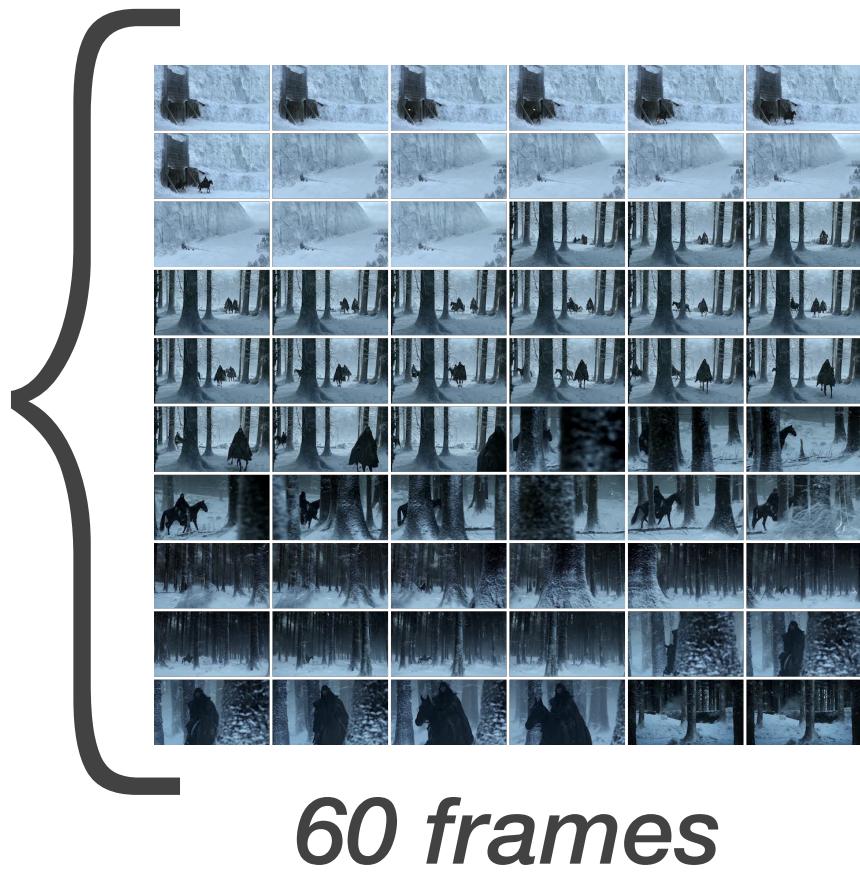
*When you play the
Game of Thrones,
you win or you die.*

Subtitles



Data

Video

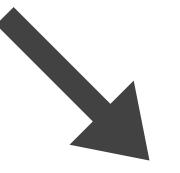
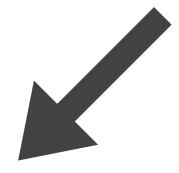


60 frames

+

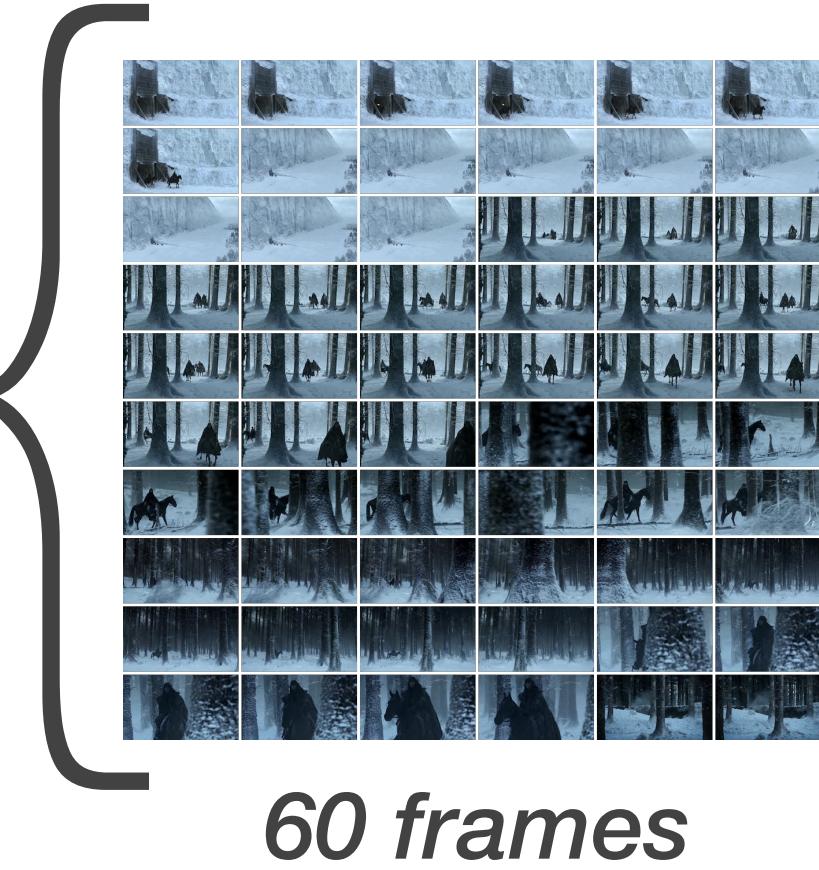
*When you play the
Game of Thrones,
you win or you die.*

Subtitles



Data

Video

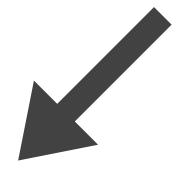


60 frames

+

*When you play the
Game of Thrones,
you win or you die.*

Subtitles

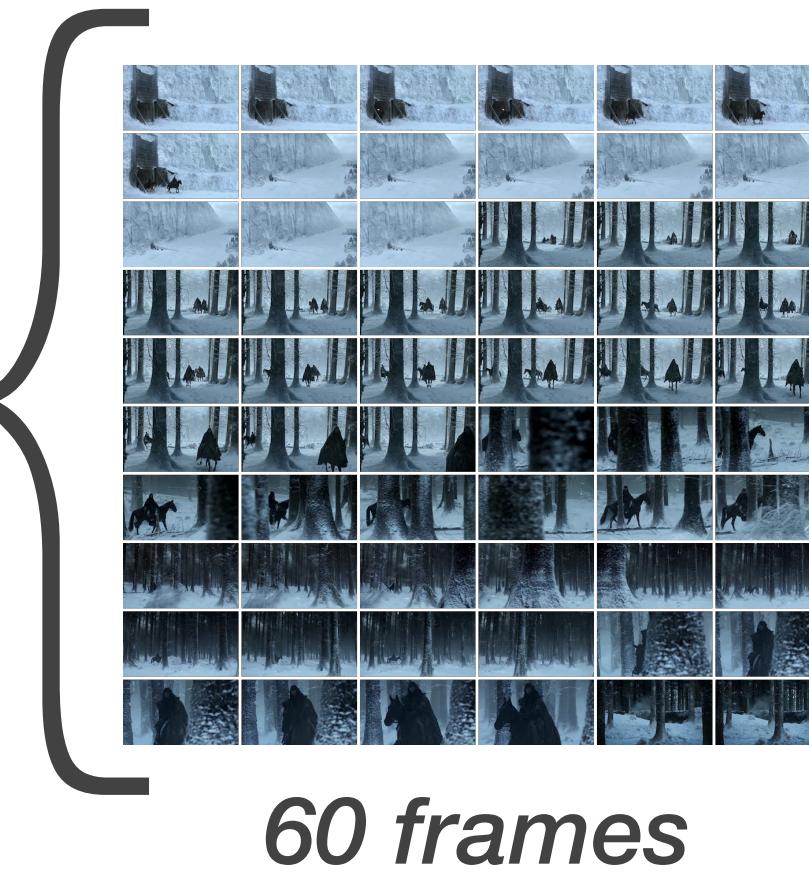


*When you **play** the Game of Thrones,
you **win** or you **die**.*



Data

Video



60 frames

+

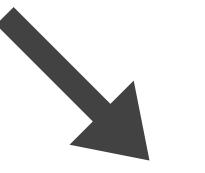
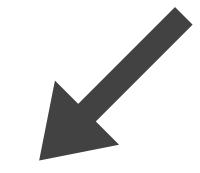
*When you play the
Game of Thrones,
you win or you die.*

Subtitles



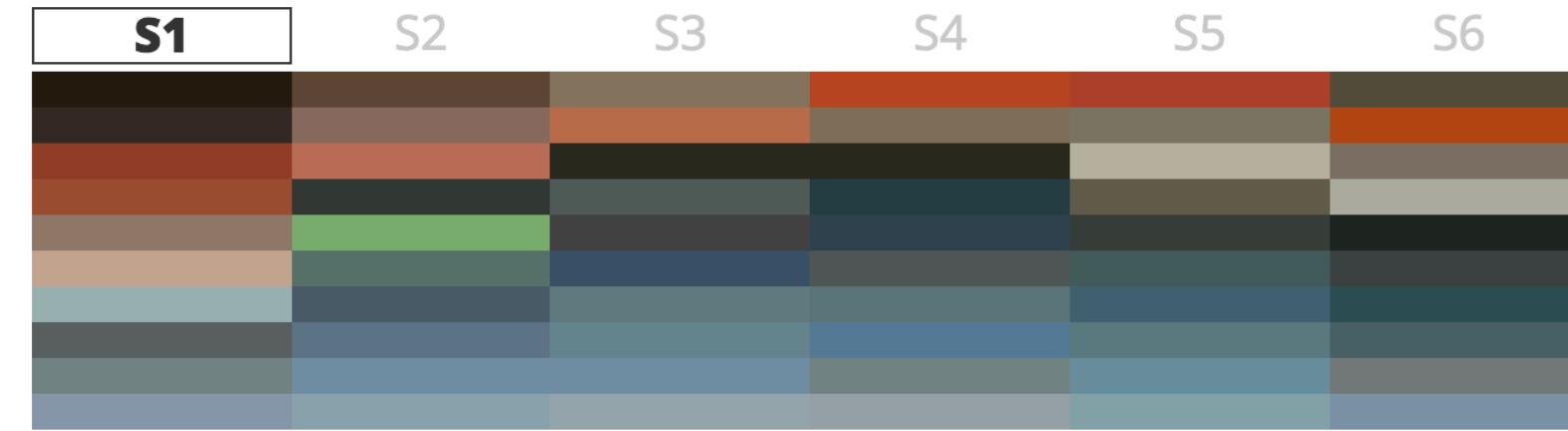
Data

Season	Episode	Time	Color	Positive	Death	...
1	7	11		2	1	...



*When you **play** the Game of Thrones,
you **win** or you **die**.*



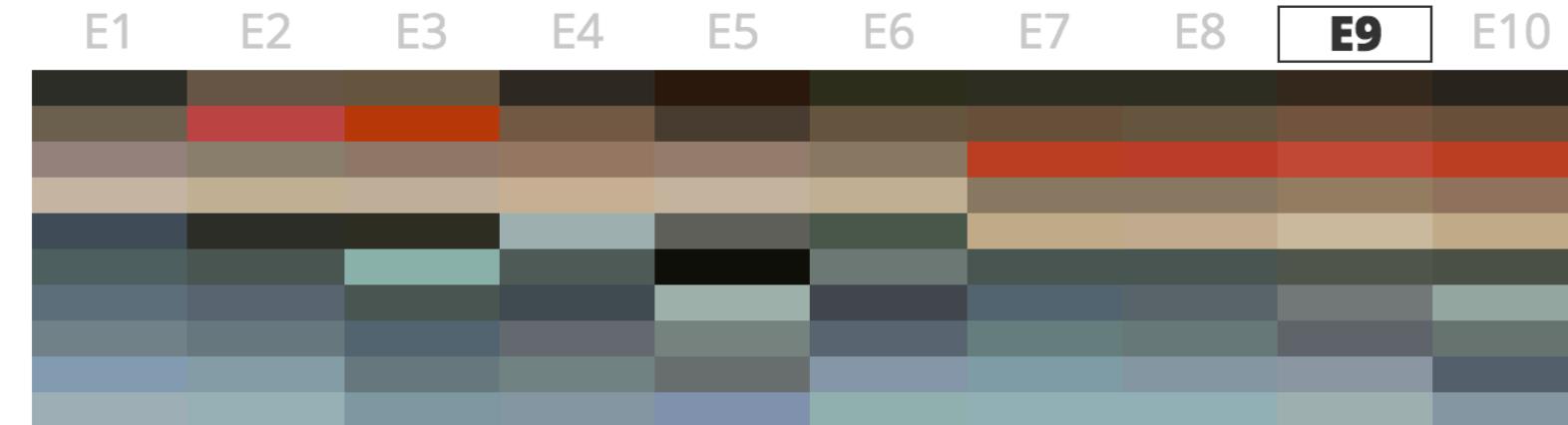


Season 1

First aired in: April 17, 2011

Last aired in: June 19, 2011

Average U.S. viewers: 2.52 million



S1E9: "Baelor"

Directed by: Alan Taylor

Written by: David Benioff & D. B. Weiss

Original Air Date: June 12, 2011

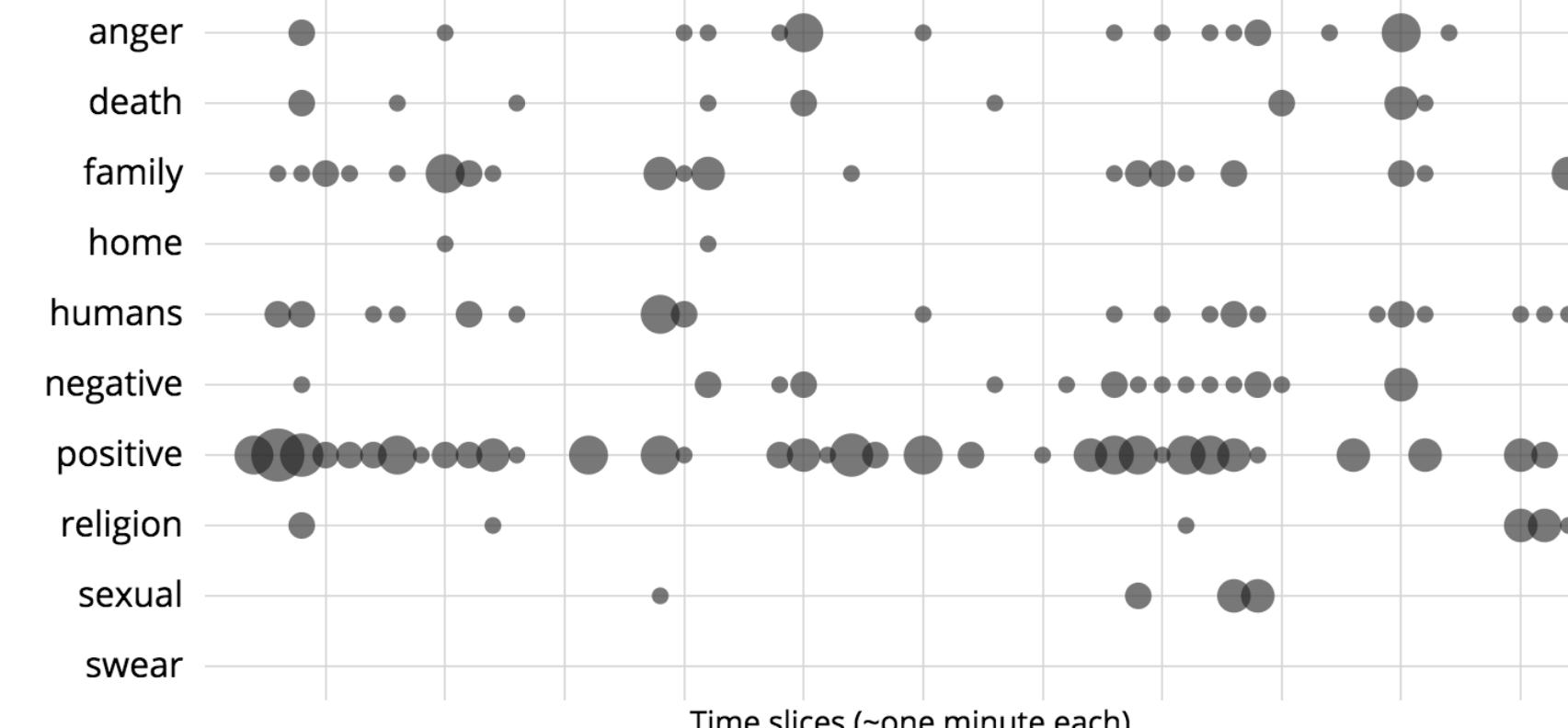
U.S. viewers: 2.66 million

Runtime: 56 minutes

Frames



0 5 10 15 20 25 30 35 40 45 50 55

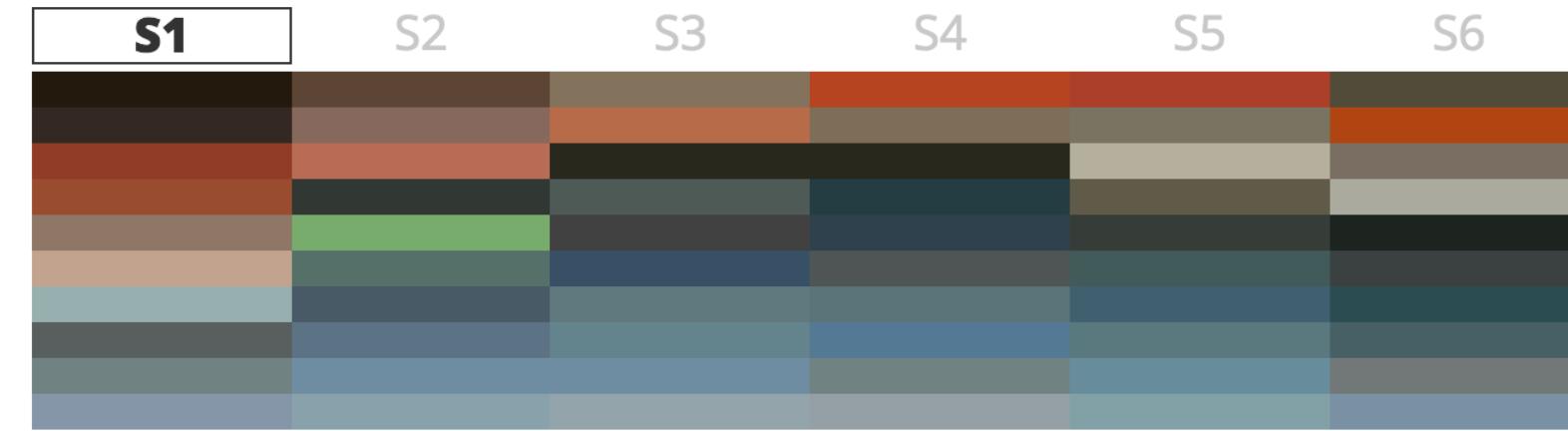


Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6

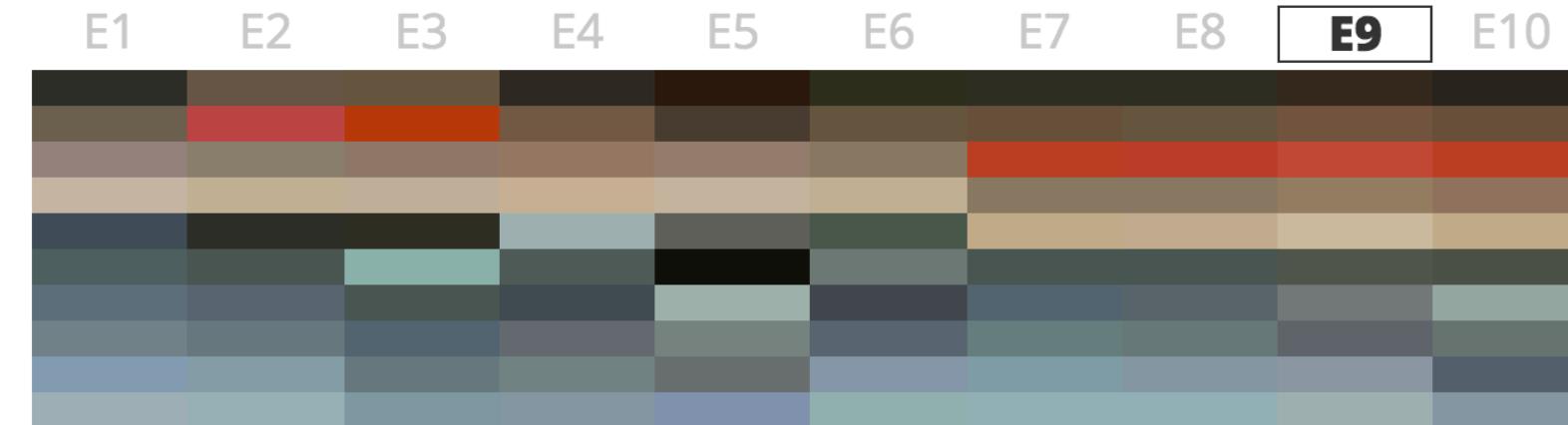


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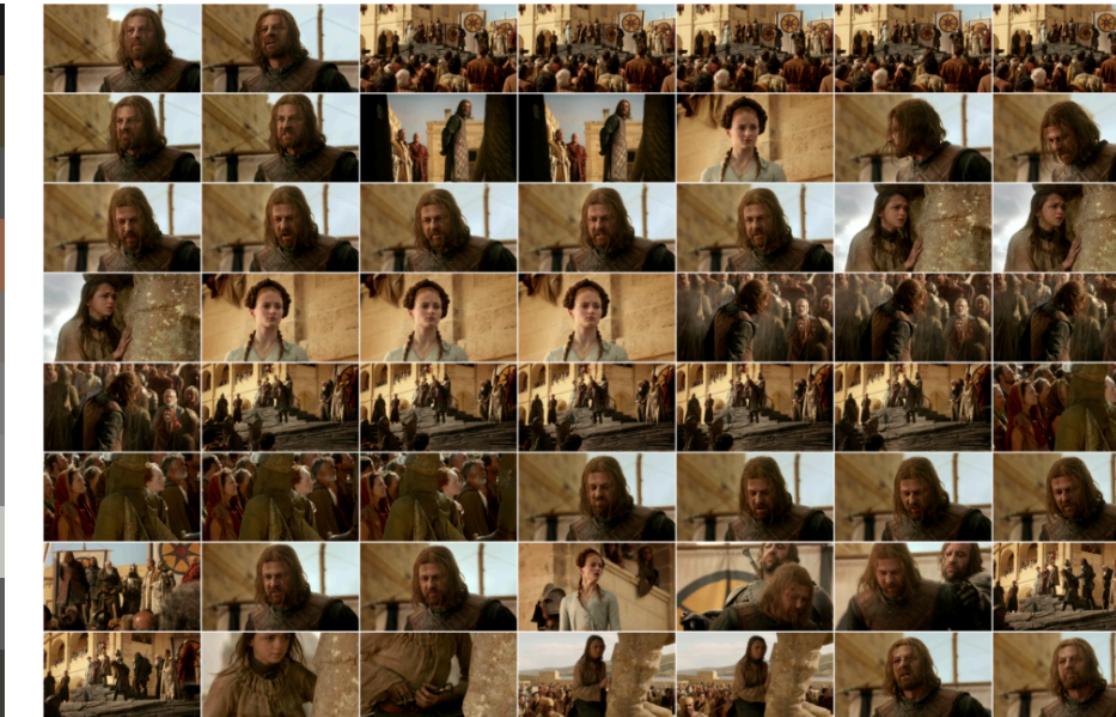
Written by: David Benioff & D. B. Weiss

Original Air Date: June 12, 2011

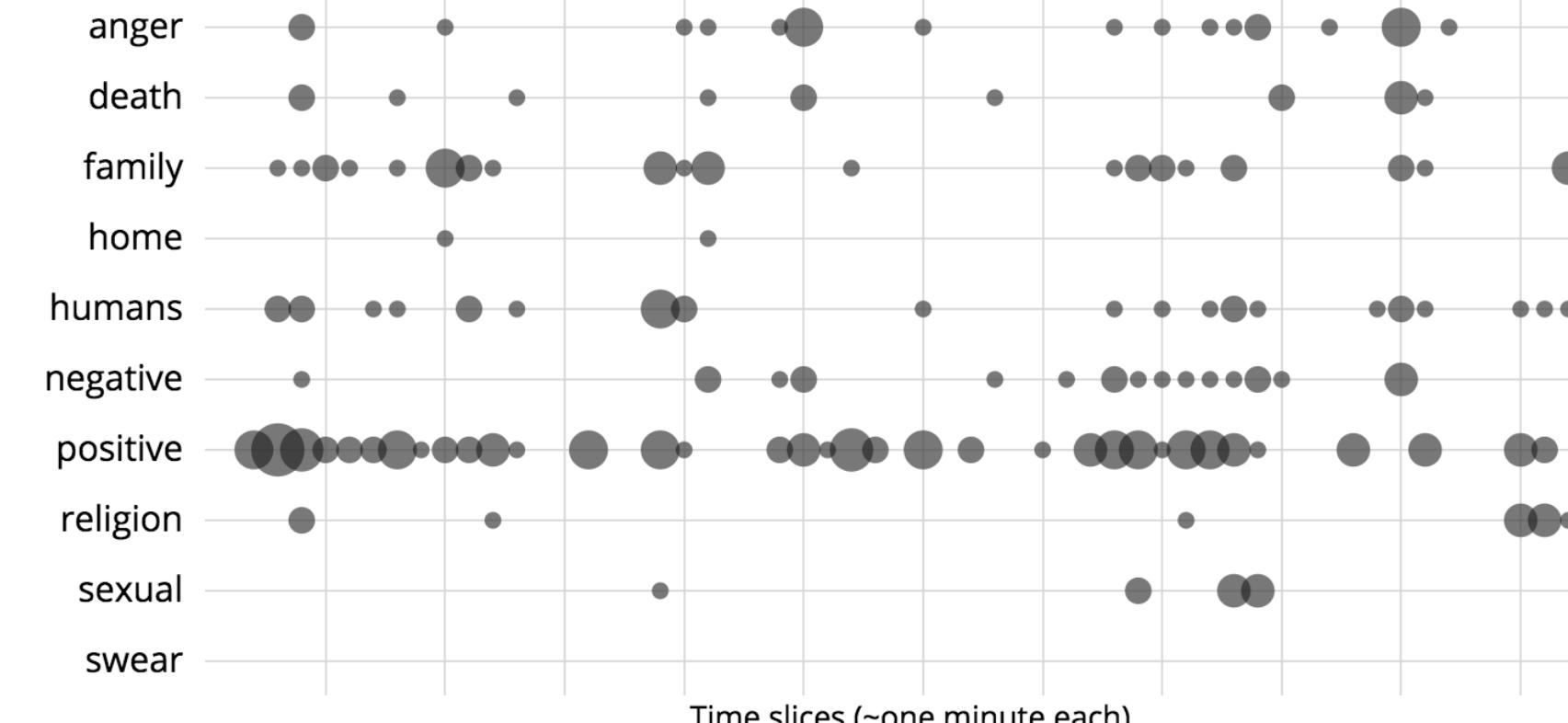
U.S. viewers: 2.66 million

Runtime: 56 minutes

Frames



0 5 10 15 20 25 30 35 40 45 50 55



Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.

I come before you to confess my treason
in the sight of Gods and men.

I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,

but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.

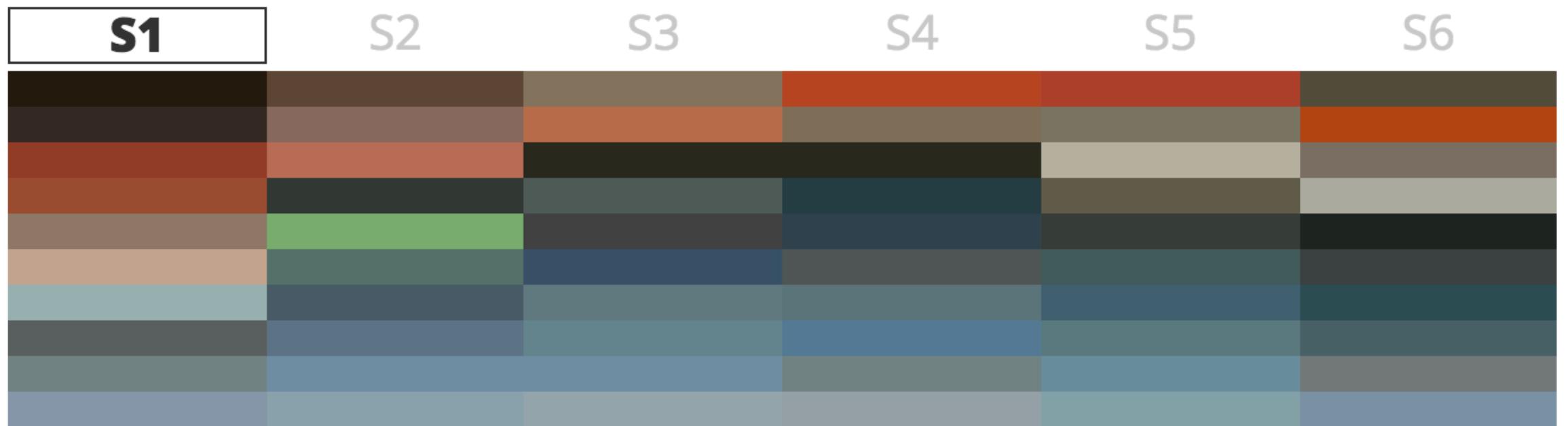
Traitor!

Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6

Color Slice Plot

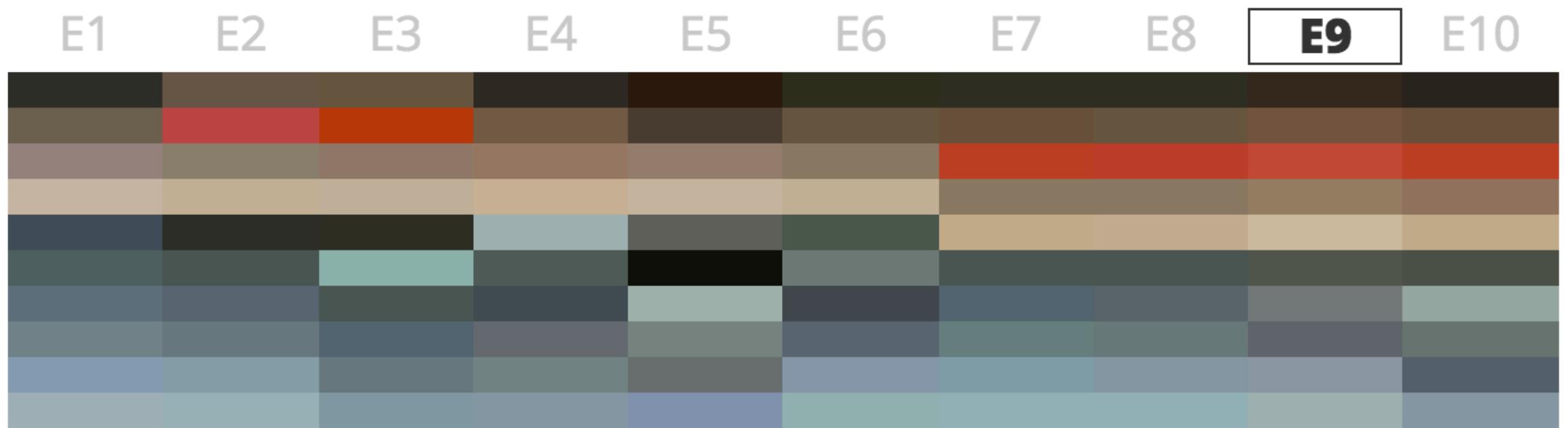


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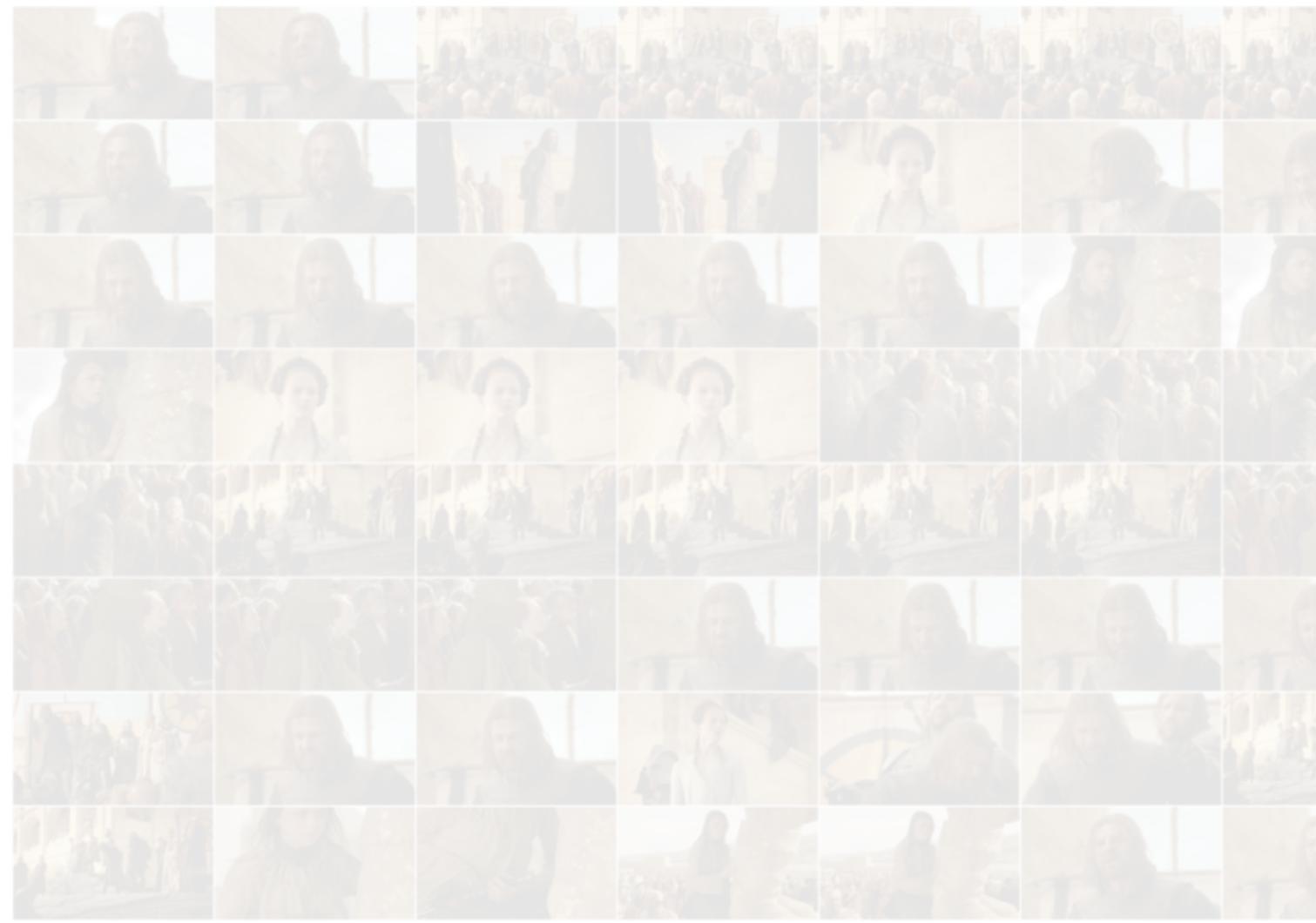
Runtime: 56 minutes



0 5 10 15 20 25 30 35 40 45 50 55

anger

Frames



Dialogue

I am Eddard Stark,
Lord of Winterfell

Top words in S1

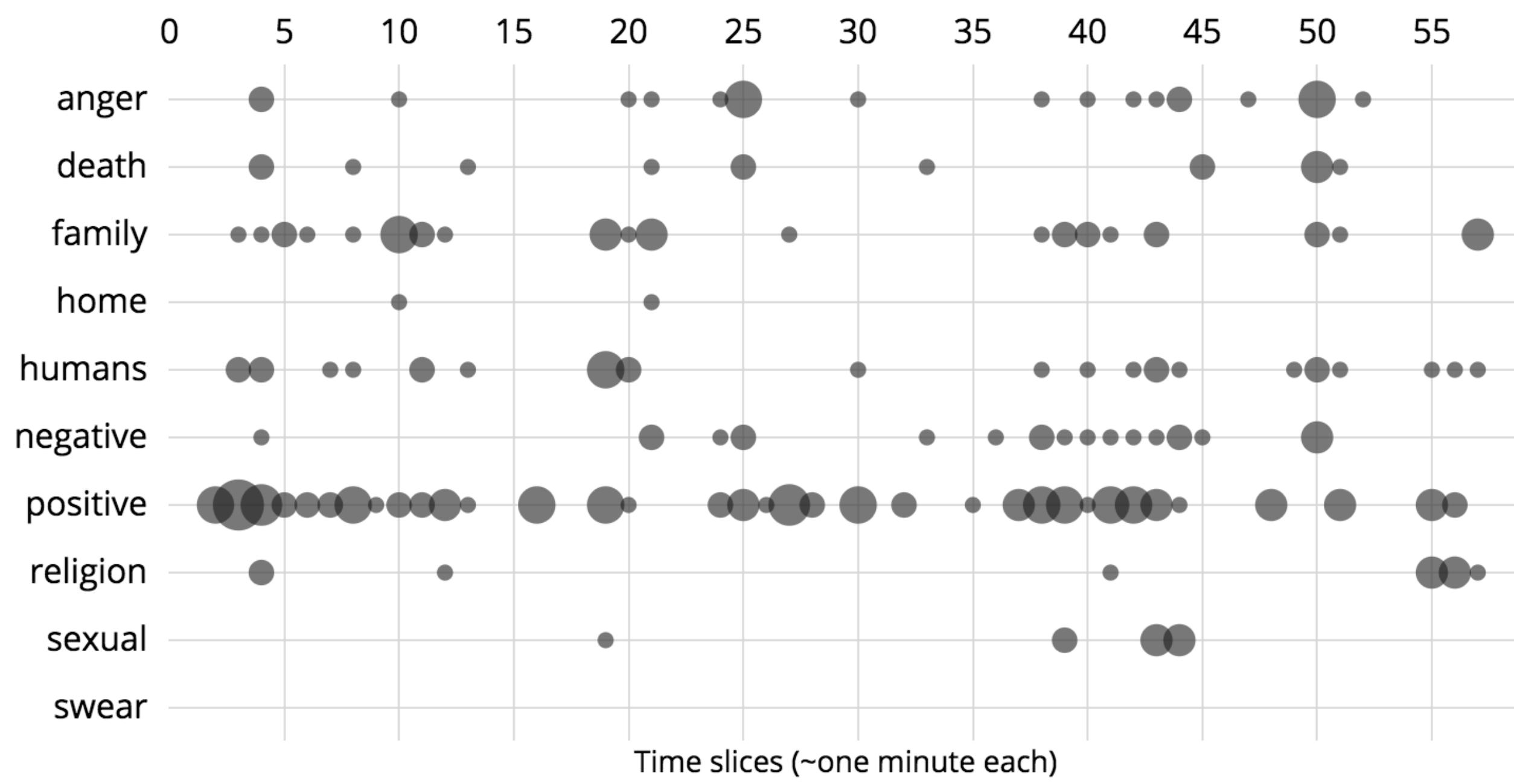
sword
honor

Runtime: 56 minutes

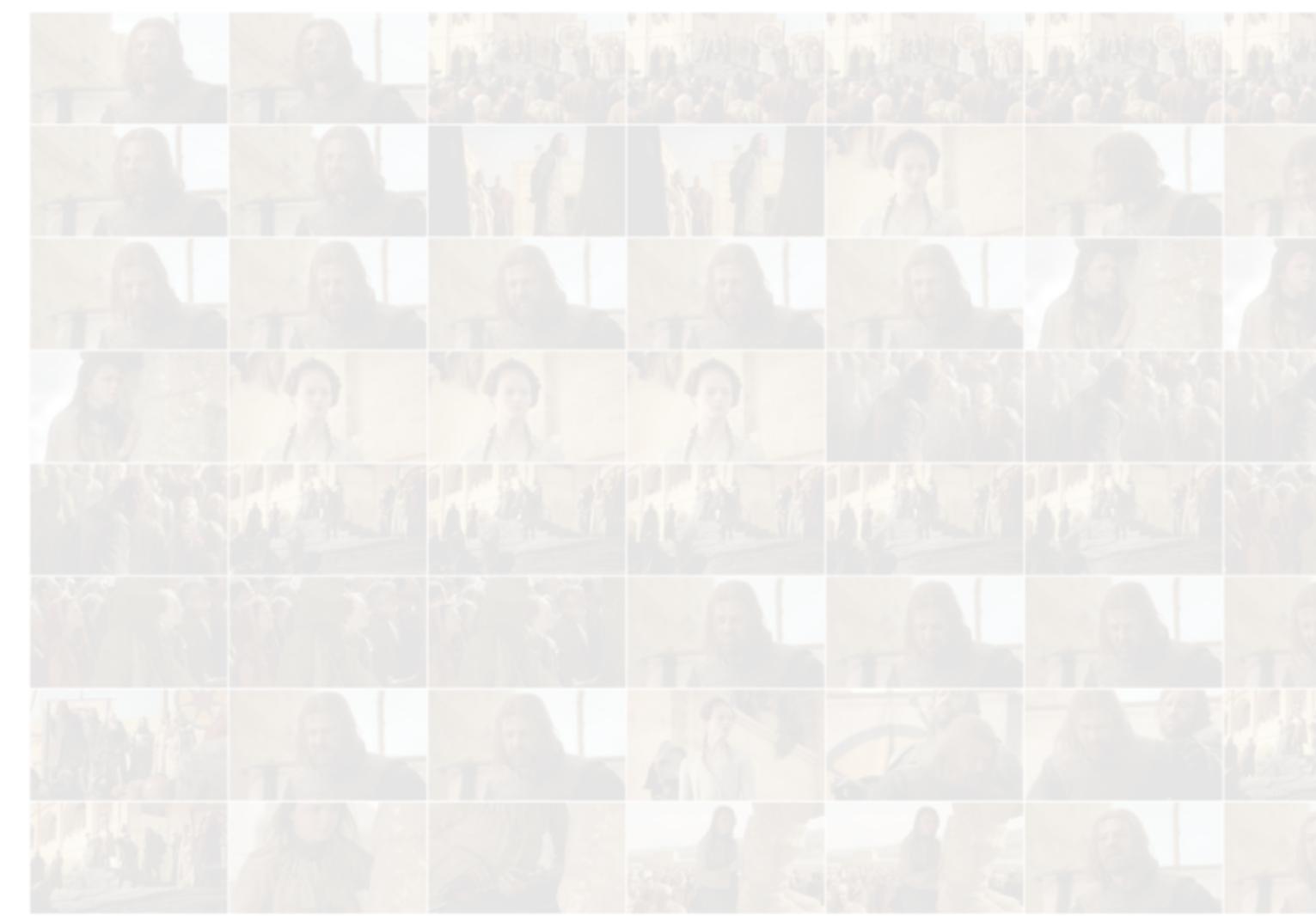
Color Slice Plot



Dialogue Plot



Frames



Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1

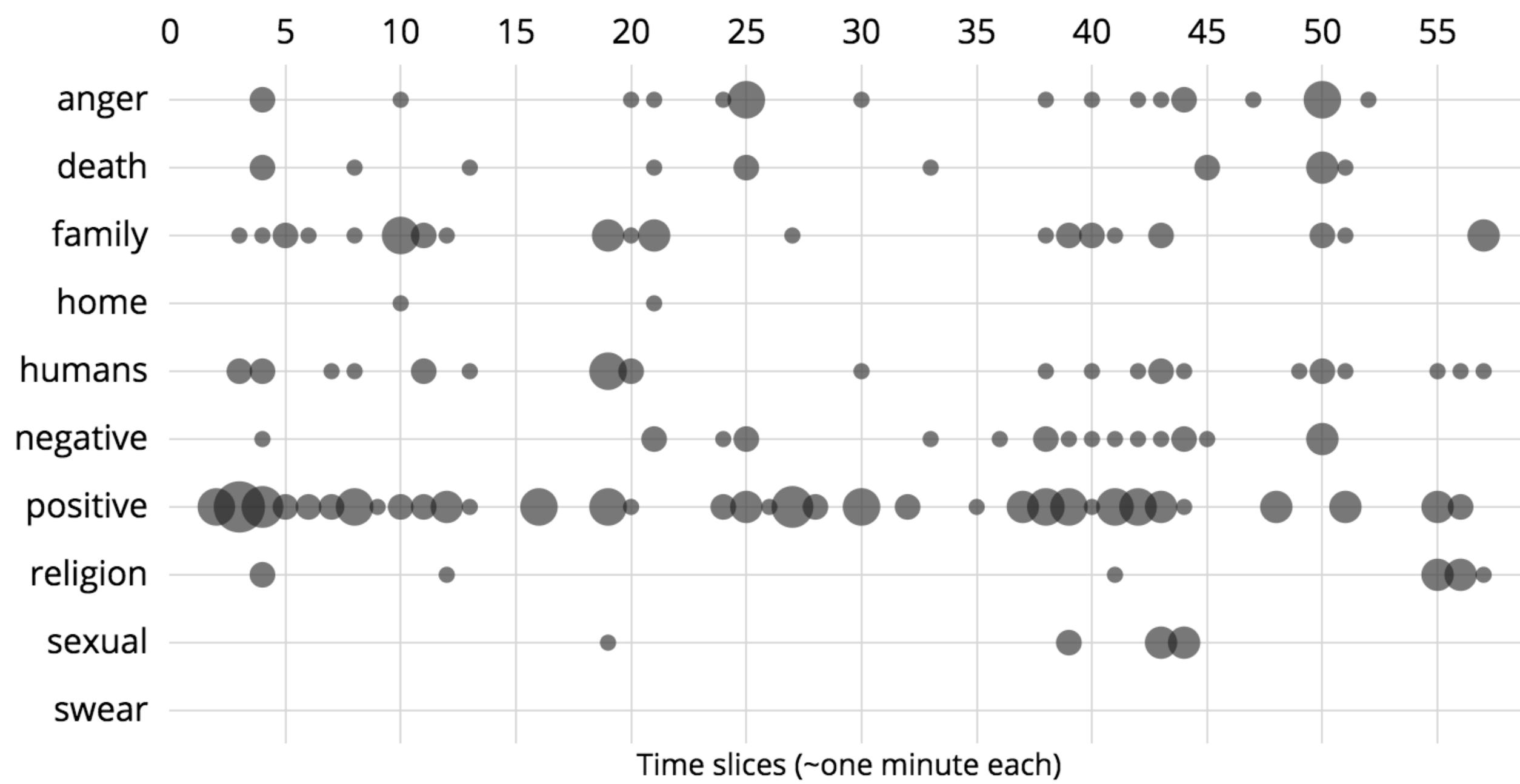
sword
honor
drink
khaleesi
must
hand
half
fine
stop
years

Runtime: 56 minutes

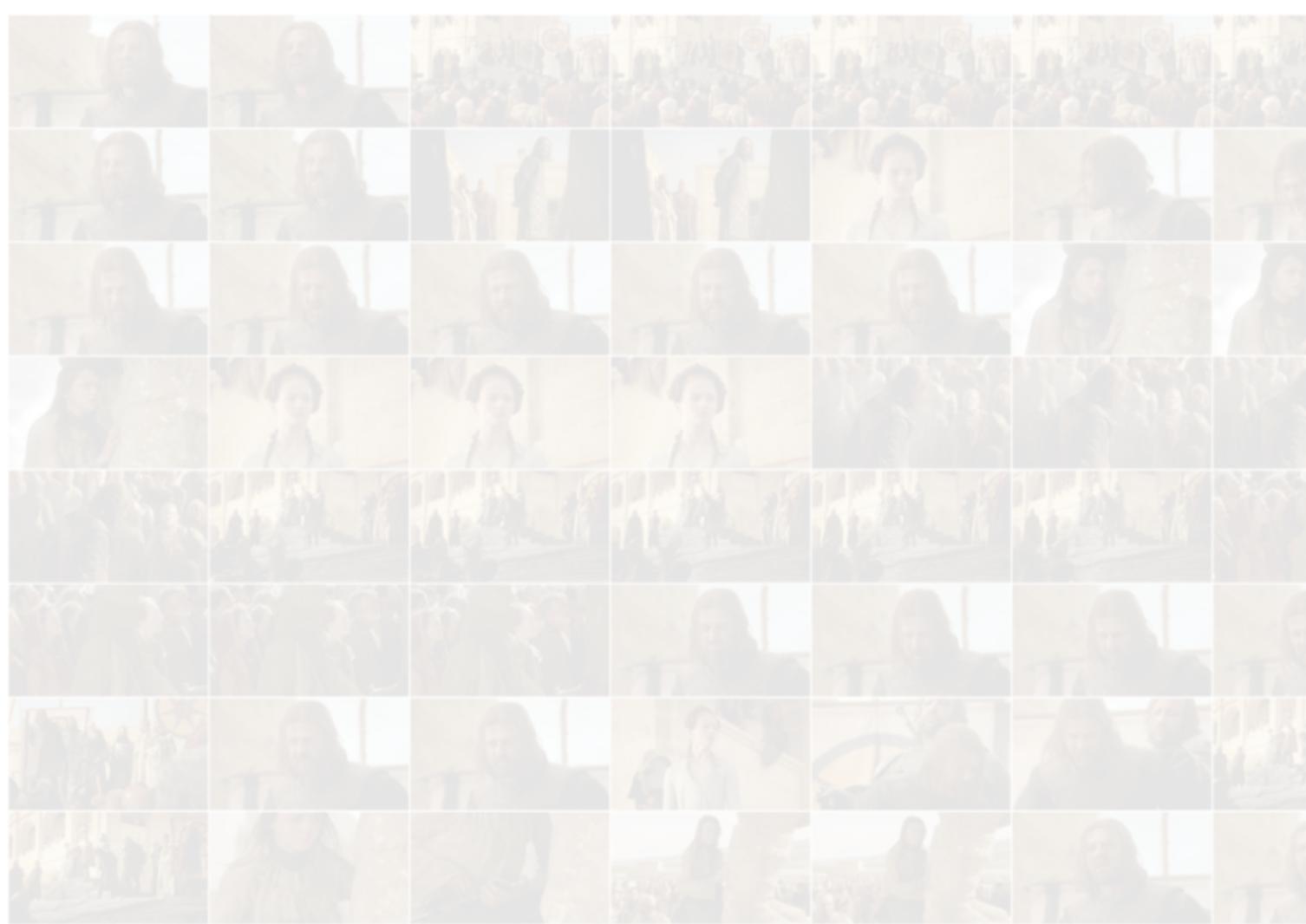
Color Slice Plot



Dialogue Plot



Frames



Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1

sword
honor
drink
khaleesi
must
hand
half
fine
stop
years

S2

S3

S4

S5

S6

Season 1

First aired in: April 17, 2011

Last aired in: June 19, 2011

Average U.S. viewers: 2.52 million

E3 E4 E5 E6 E7 E8 **E9** E10

Metadata

S1E9: "Baelor"

Directed by: Alan Taylor

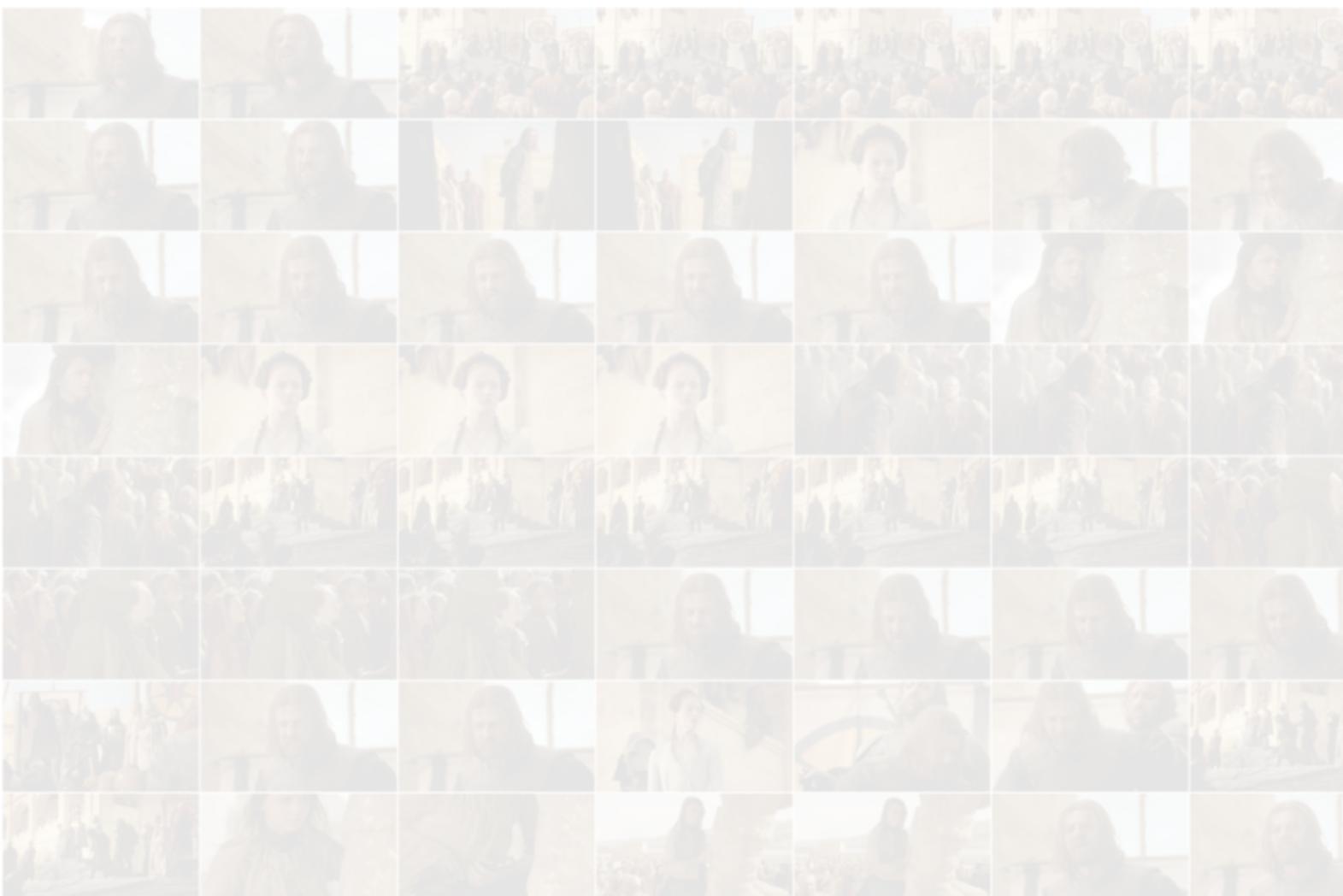
Written by: David Benioff & D. B. Weiss

Original Air Date: June 12, 2011

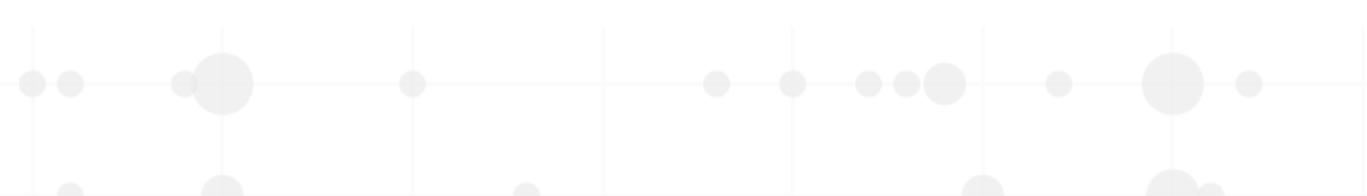
U.S. viewers: 2.66 million

Runtime: 56 minutes

Frames



15 20 25 30 35 40 45 50 55

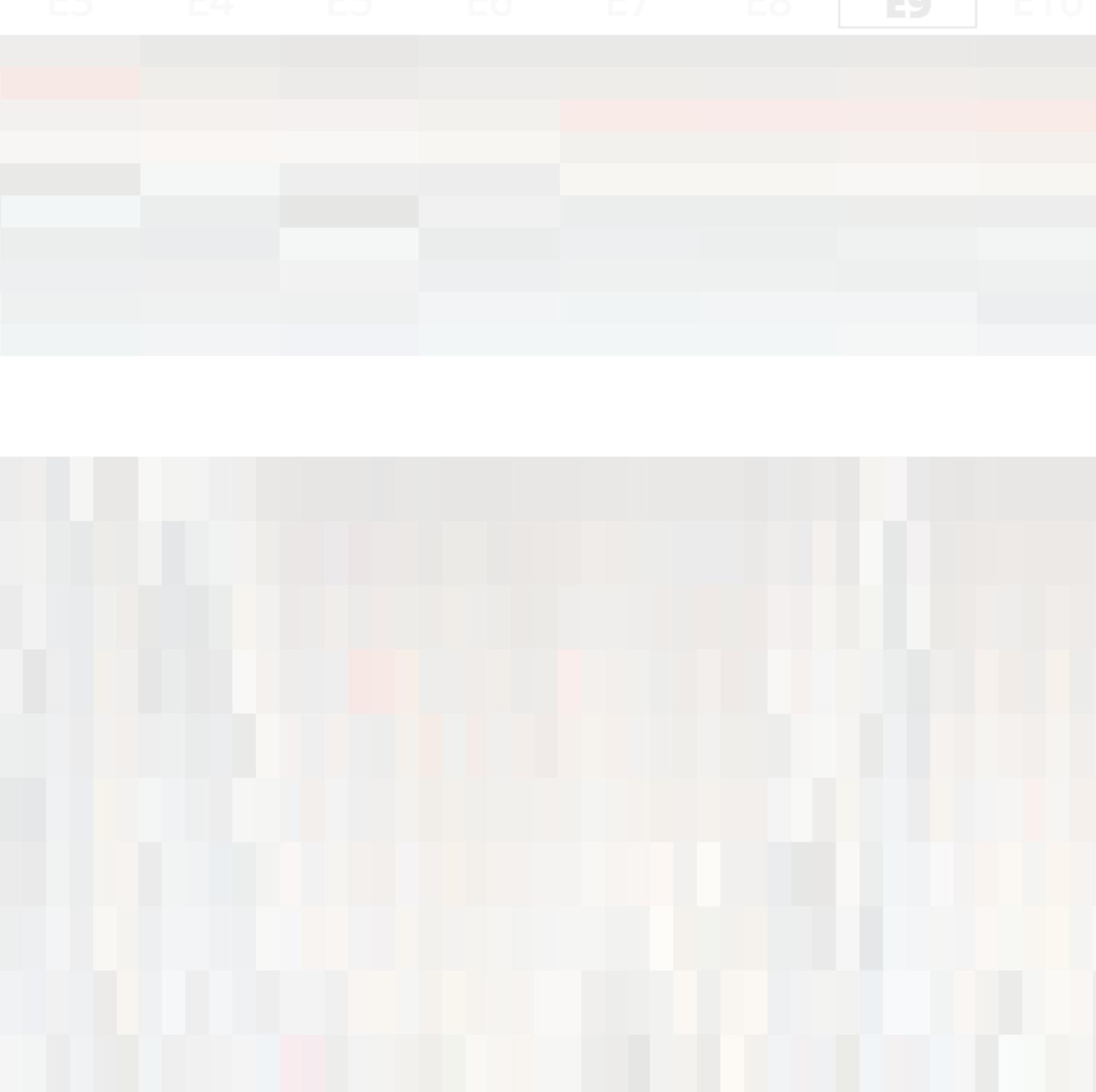


Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.

Top words in S1E9

sword	13
honor	9
King	2



S1E9: "Baelor"

Directed by: Alan Taylor

Written by: David Benioff & D. B. Weiss

Original Air Date: June 12, 2011

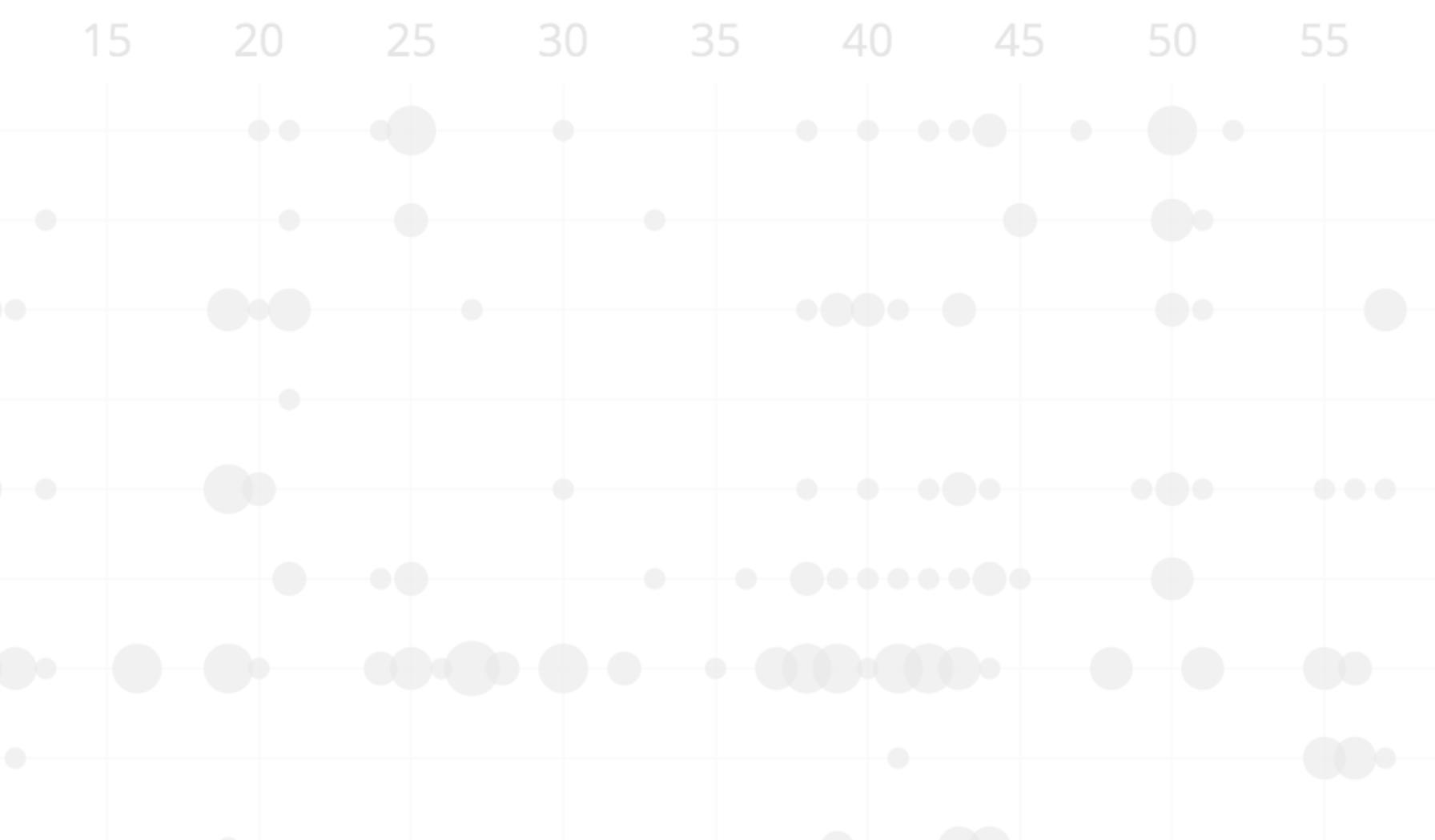
U.S. viewers: 2.66 million

Runtime: 56 minutes

Frames



Frames



Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon

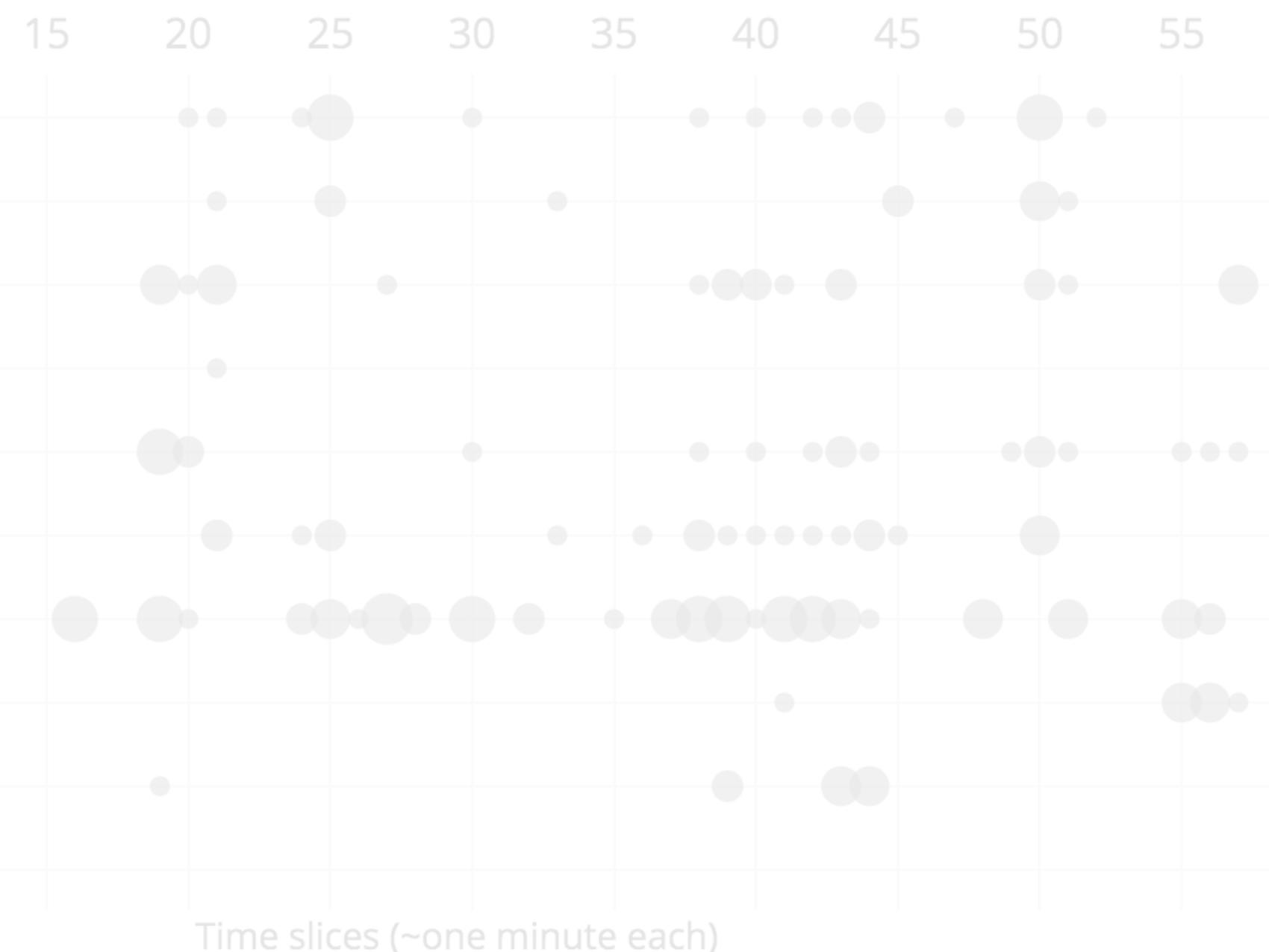
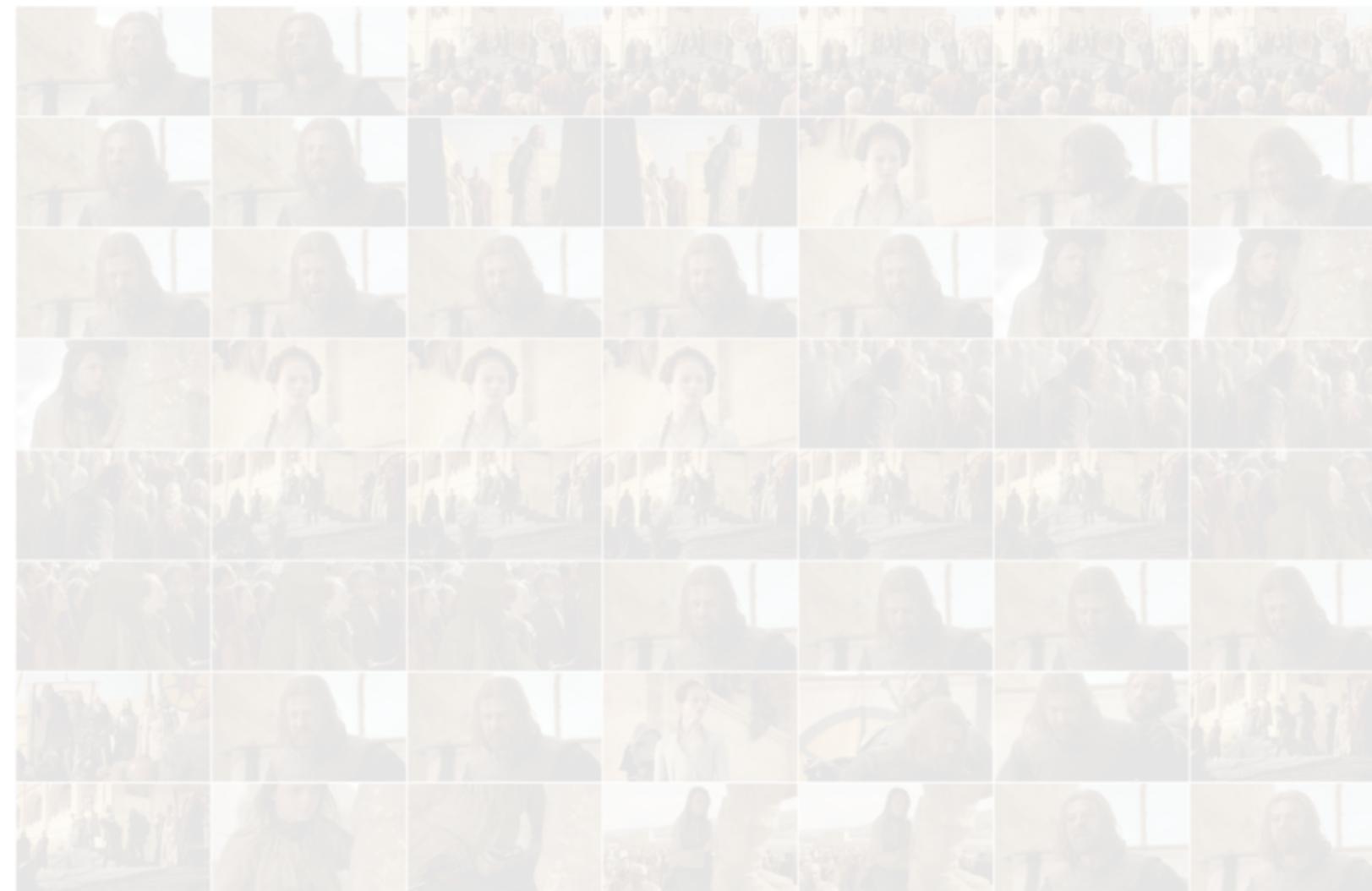
Top words in S1E9

sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6



U.S. viewers: 210 million
Runtime: 56 minutes

Frames



Dialogue

I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

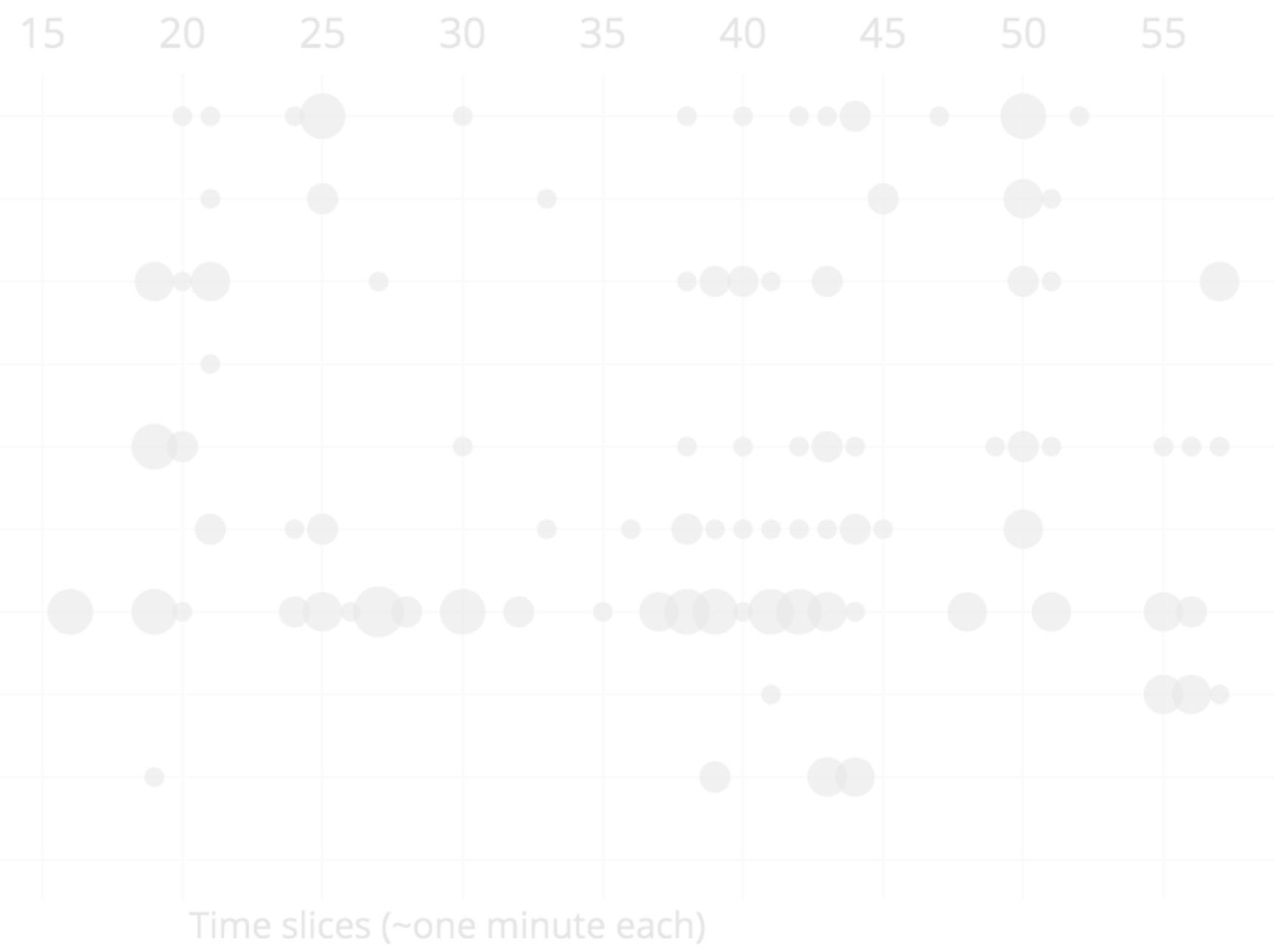
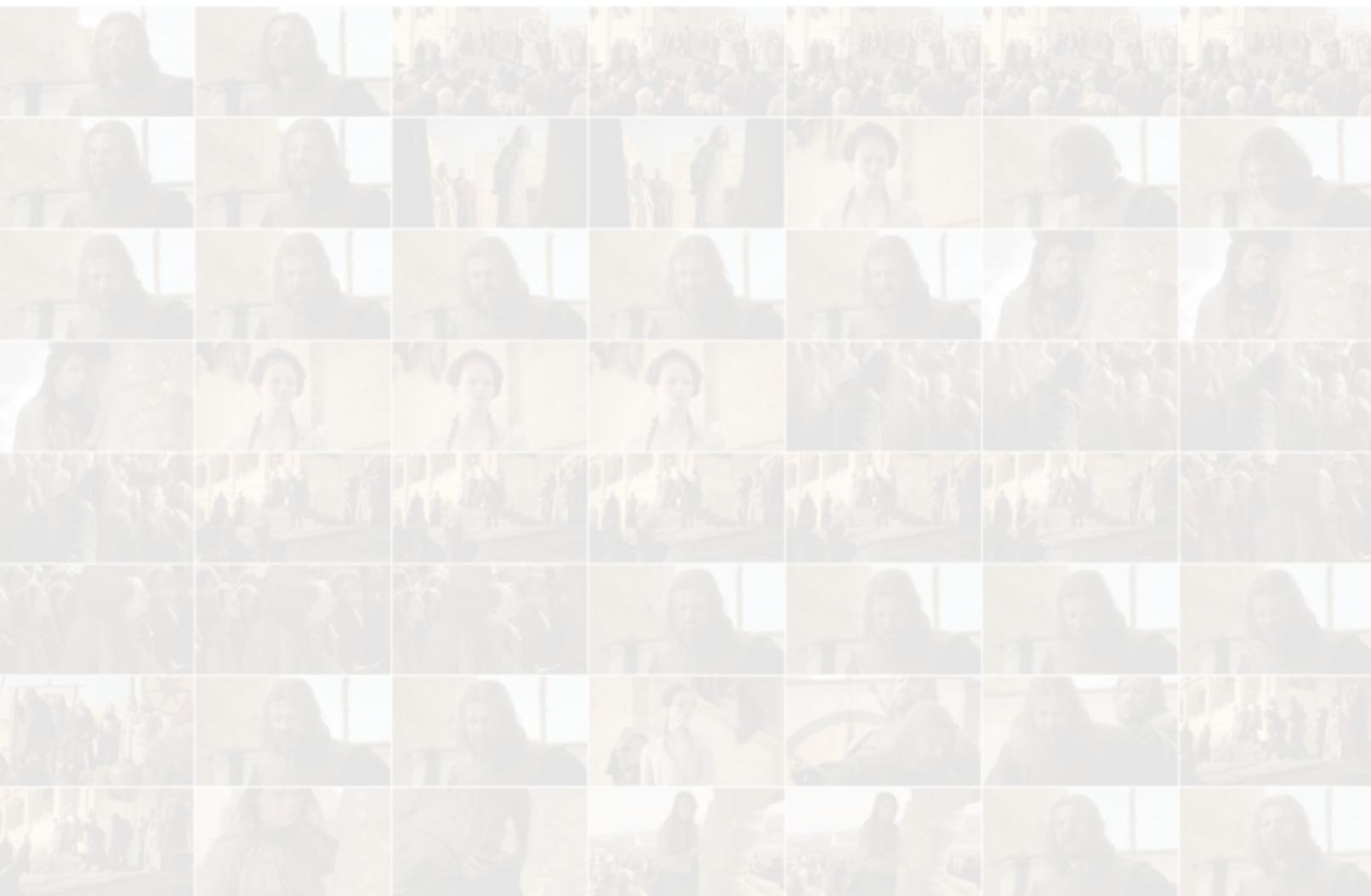
sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6

Dialogue

U.S. viewers: 2.65 million

Runtime: 56 minutes

Frames



Dialogue

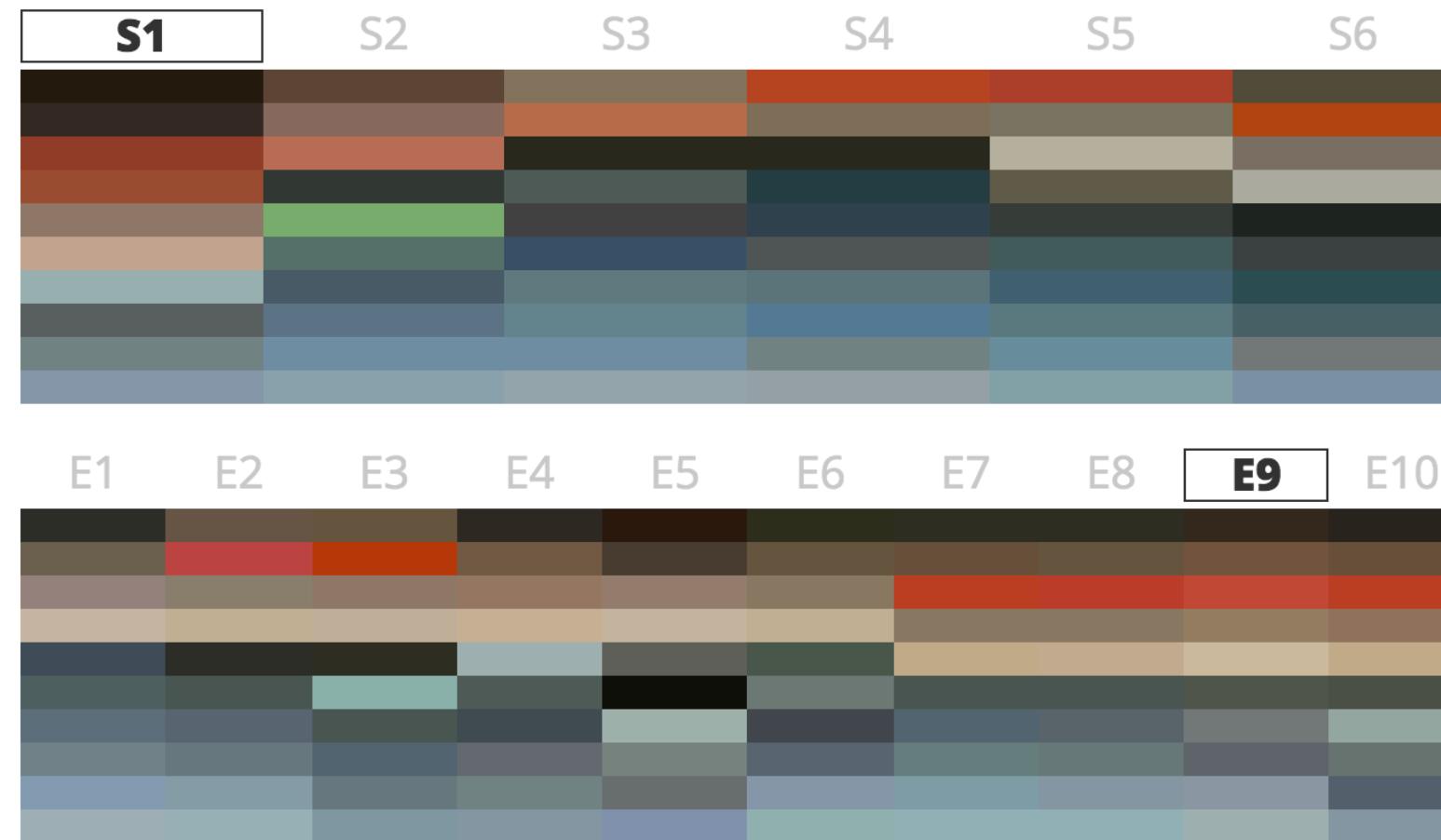
I am Eddard Stark,
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and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

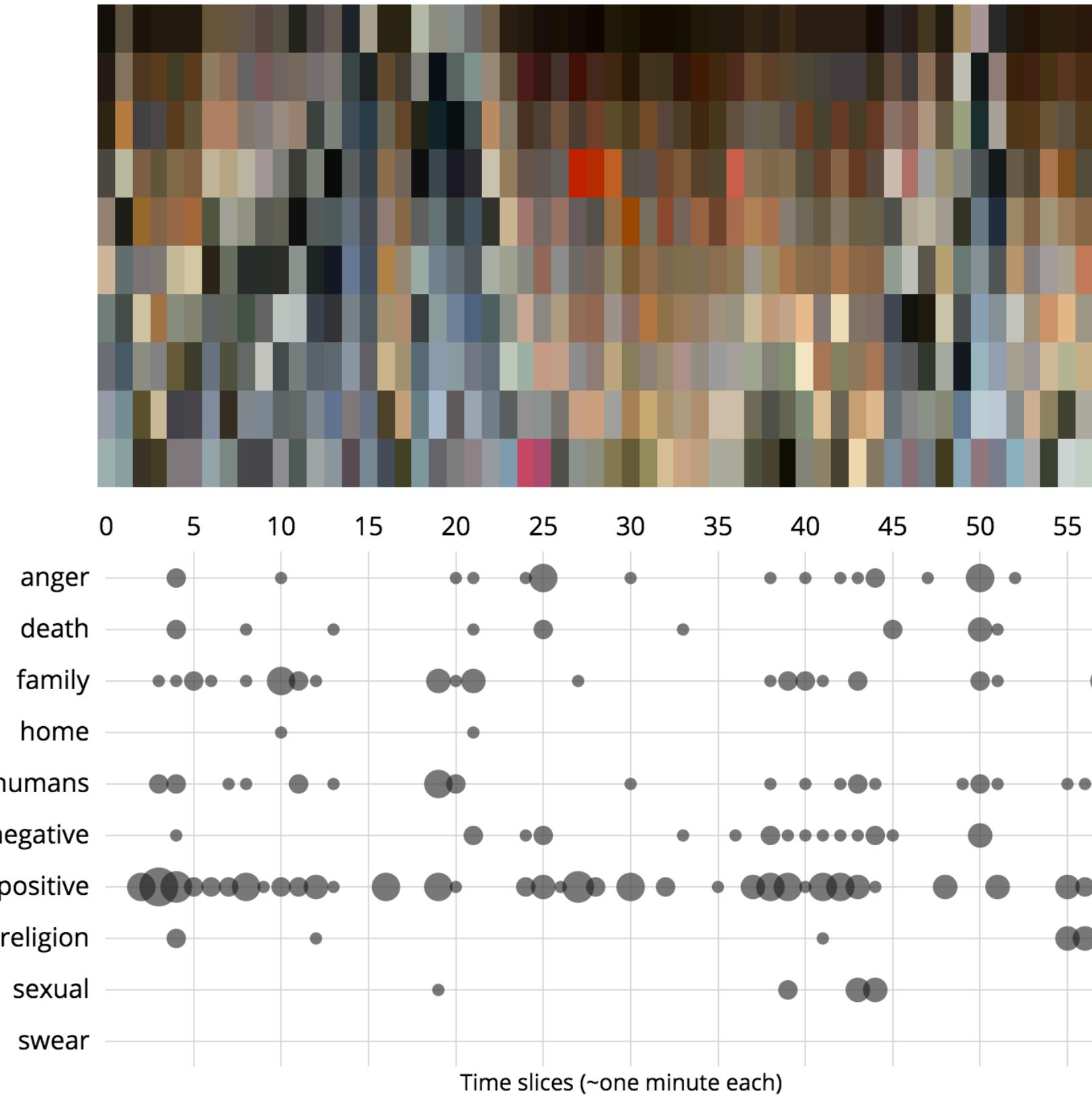
sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6

Top Words

Color Slice Plot



Dialogue Plot



Season 1

First aired in: April 17, 2011
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Metadata

S1E9: "Baelor"

Directed by: Alan Taylor
Written by: David Benioff & D. B. Weiss
Original Air Date: June 12, 2011
U.S. viewers: 2.66 million
Runtime: 56 minutes

Frames



Frames

Dialogue

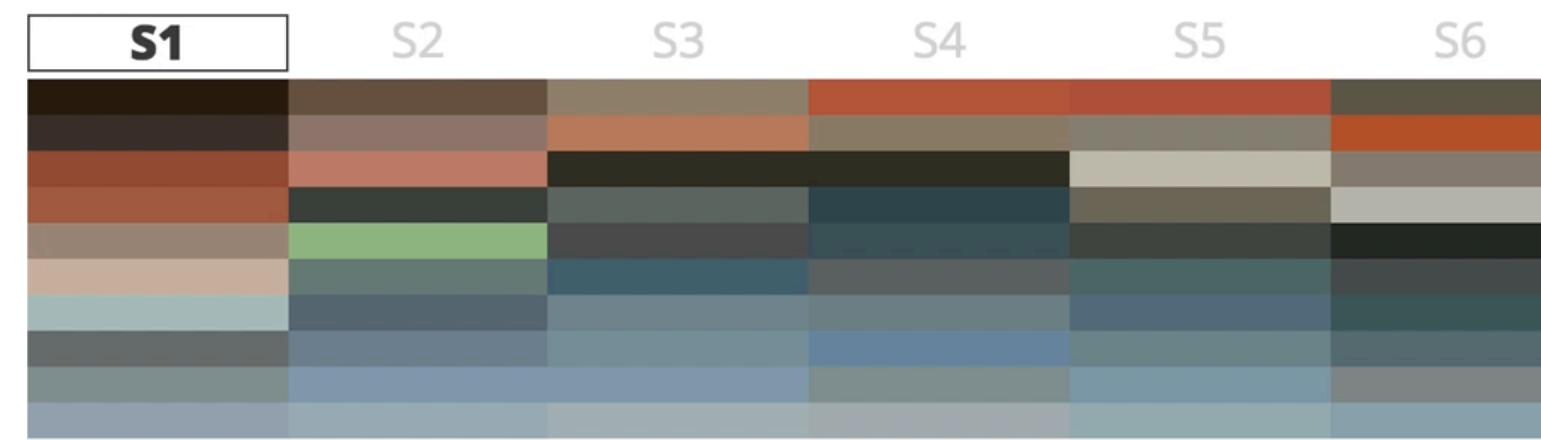
I am Eddard Stark,
Lord of Winterfell
and Hand of the King.
I come before you to confess my treason
in the sight of Gods and men.
I betrayed the faith of my King
and the trust of my friend Robert.
I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6

Top Words

Dialogue

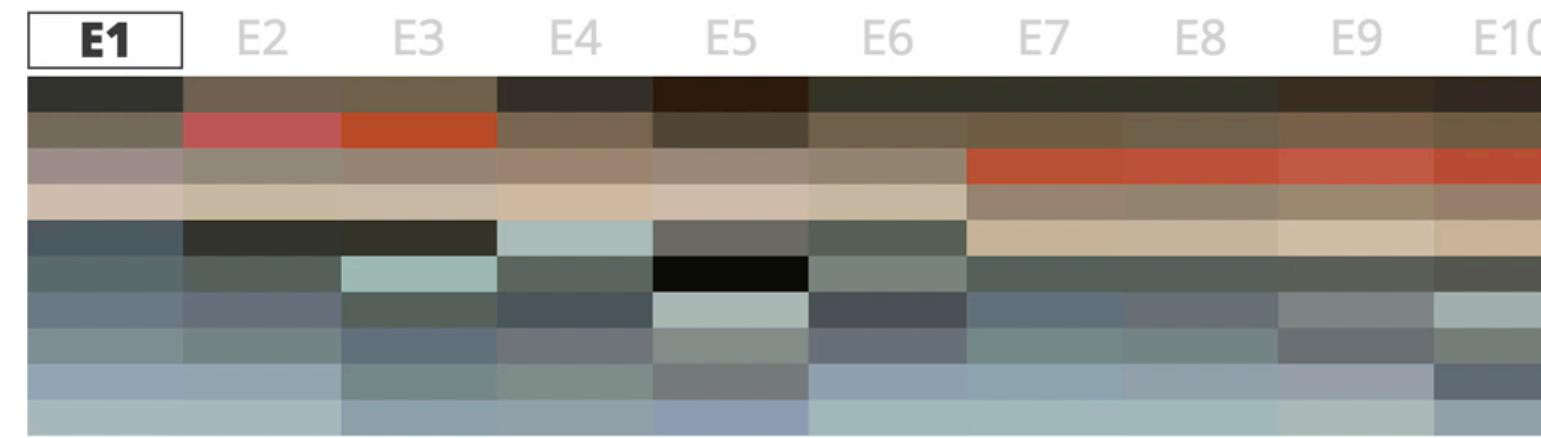


Season 1

First aired in: April 17, 2011

Last aired in: June 19, 2011

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S1E1: "Winter Is Coming"

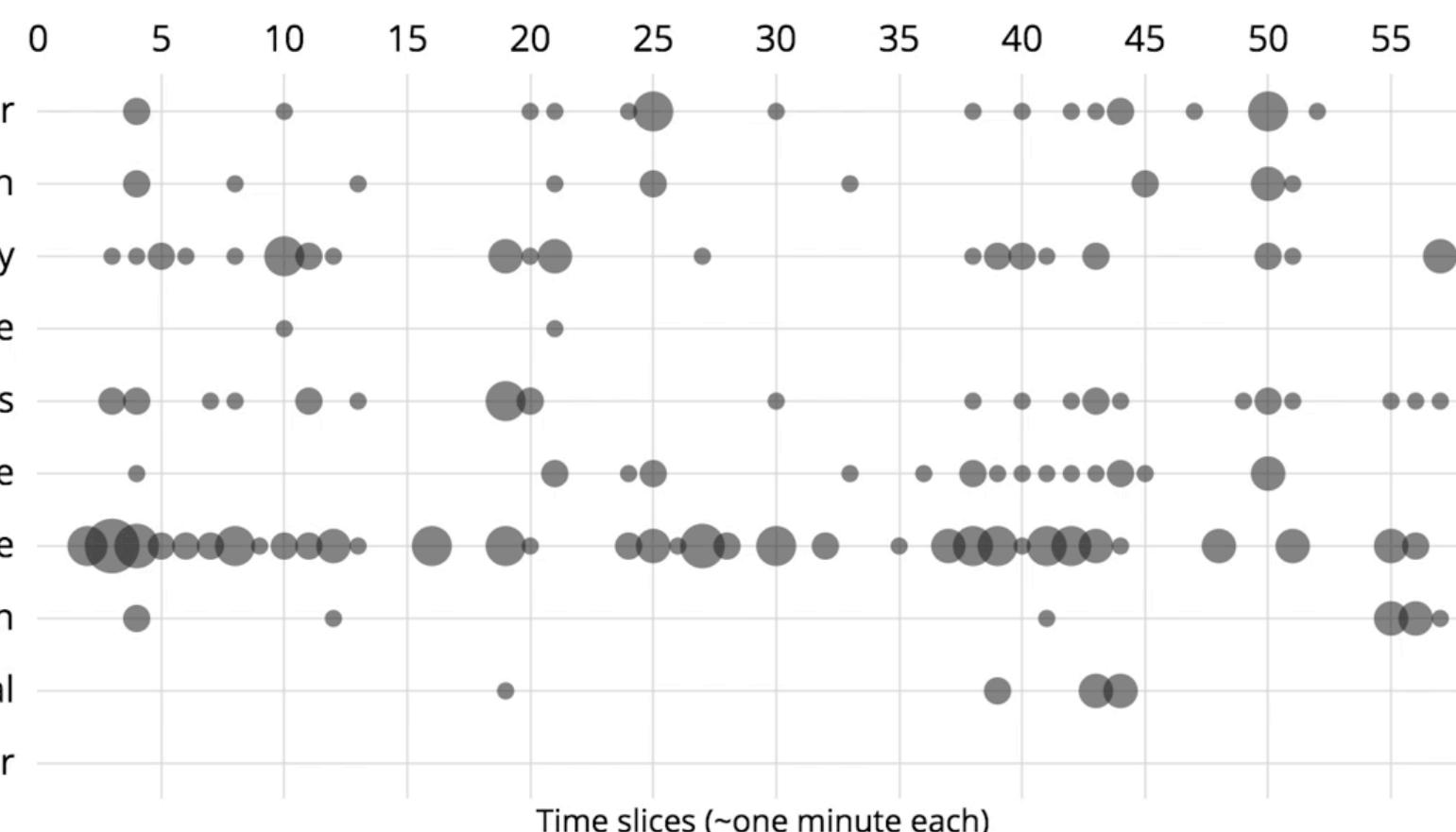
Directed by: Tim Van Patten

Written by: David Benioff & D. B. Weiss

Original Air Date: April 17, 2011

U.S. viewers: 2.22 million

Runtime: 61 minutes



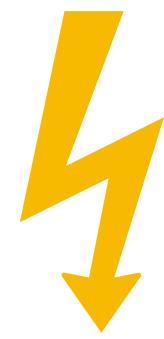
Frames



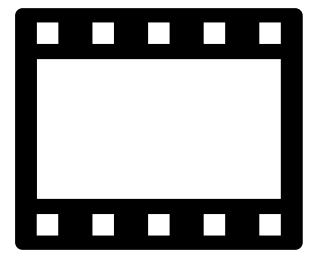
Dialogue

Top words in S1E1

sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6



Automatic data creation → no manual annotation



First step for quick video analysis



Find interesting video segments to do further high resolution inspection

MovieBarCode

Digital Humanities 2016

Companion Apps for Long Arc TV Series

TVX 2014

sViSIT

TVCG 2013

ColourVis

Computers & Graphics 2010

The Video Explorer

MMSys 2010

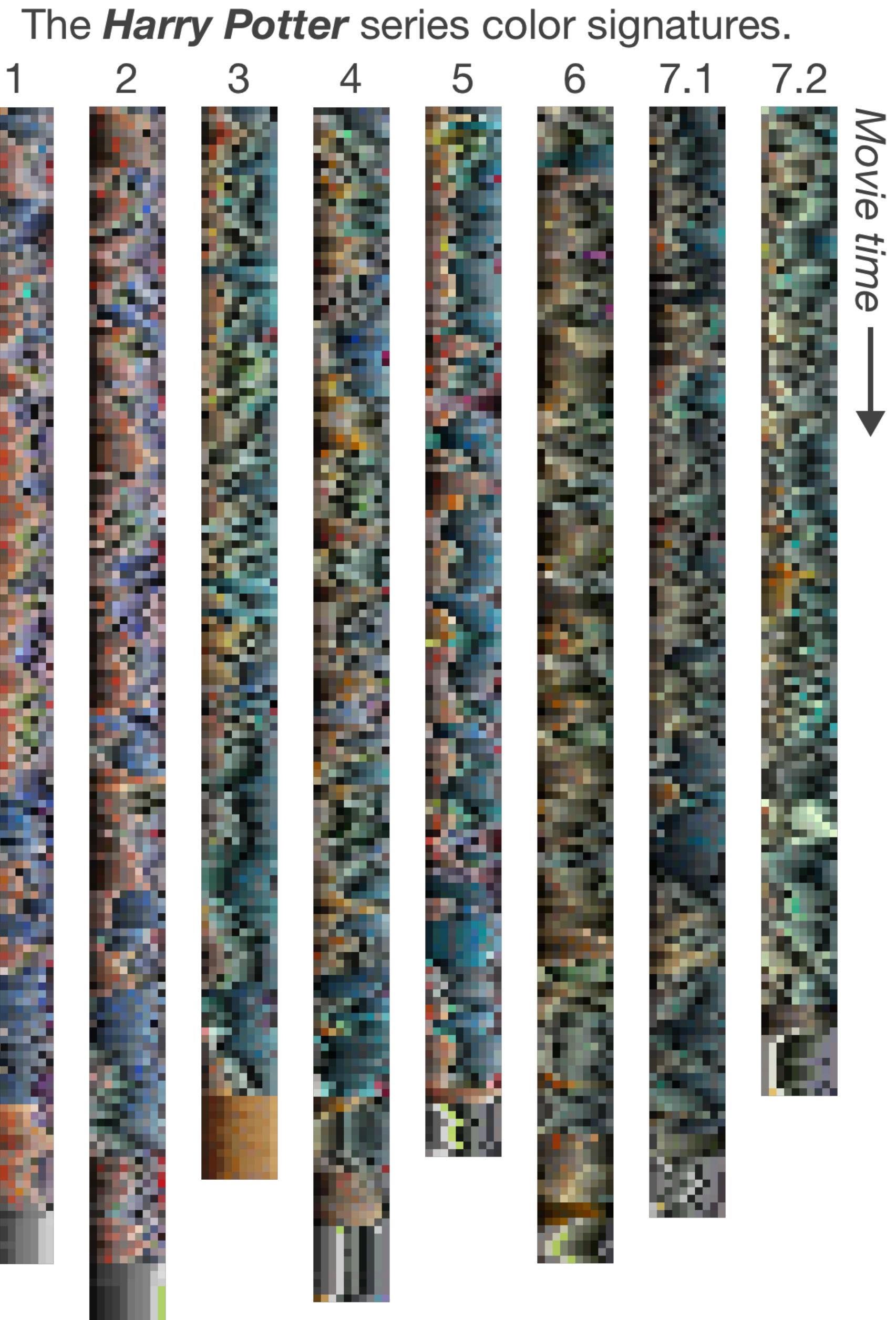
Jointly explore video with
color + text analysis

Future Work

Exploratory system evaluation

Wider range of entertainment media

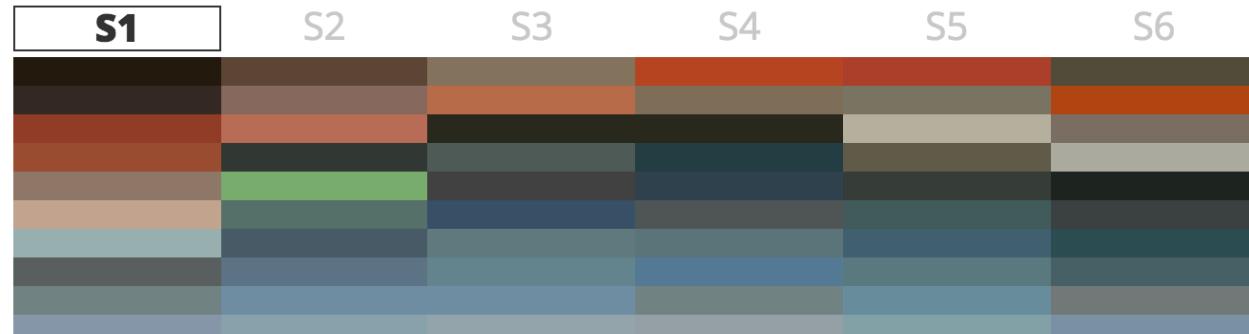
- Harry Potter
- Star Wars
- Batman movies
- *Suggestions welcome!*



A VIZ OF ICE AND FIRE

Summarizing Entertainment Video Using Color and Dialogue

fredhohman.com/a-viz-of-ice-and-fire



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S1E9: "Baelor"

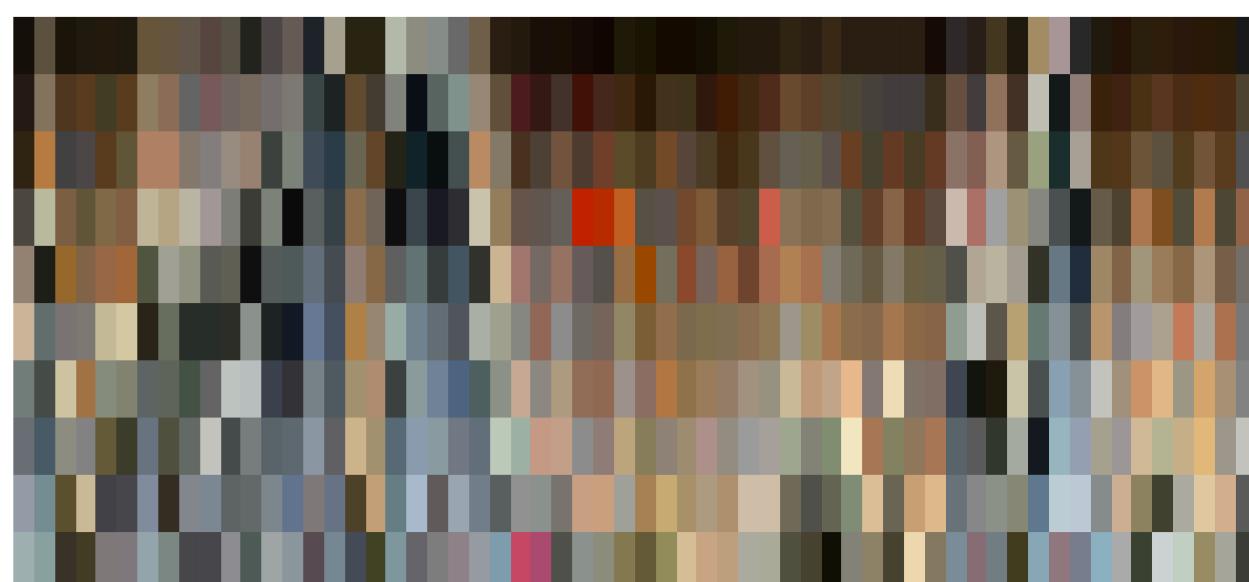
Directed by: Alan Taylor

Written by: David Benioff & D. B. Weiss

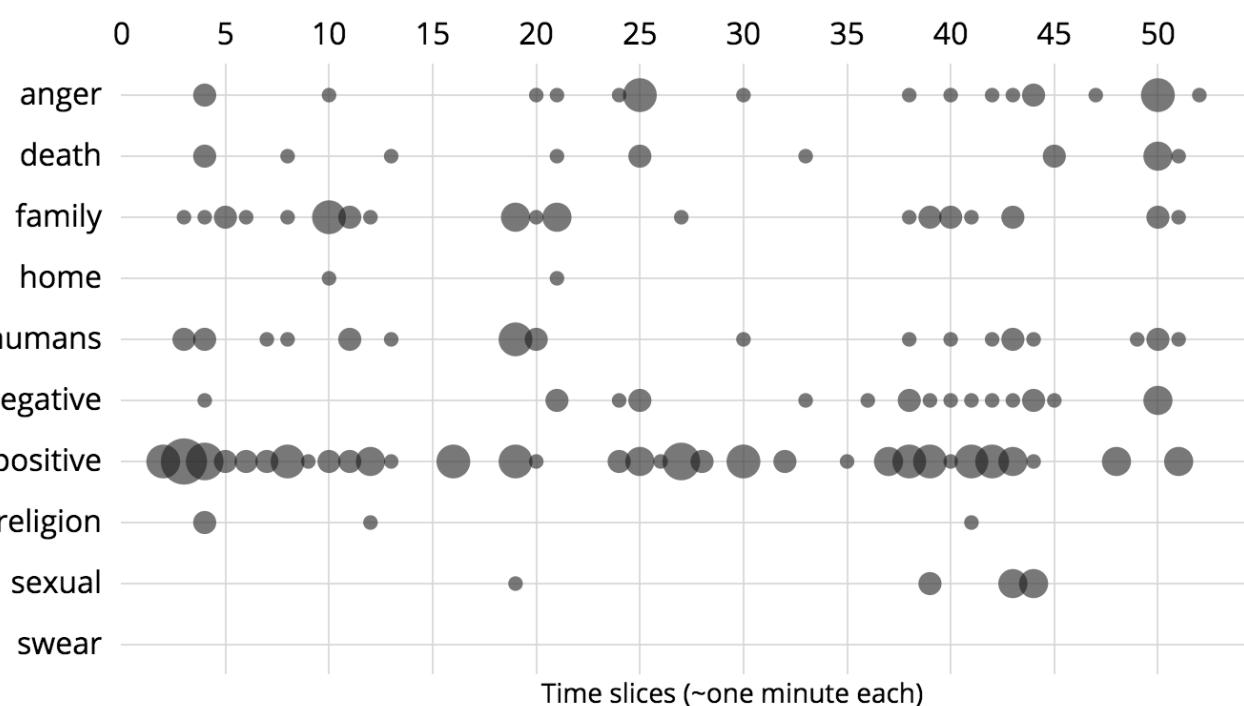
Original Air Date: June 12, 2011

U.S. viewers: 2.66 million

Runtime: 56 minutes



Frames



Dialogue

I am Eddard Stark,
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I come before you to confess my treason
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I betrayed the faith of my King
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I swore to protect and defend his
children,
but before his blood was cold
I plotted to murder his son...
And seize the Throne for myself.
Traitor!
Let the high Septon
and Baelor the blessed bear witness to
what I say:

Top words in S1E9

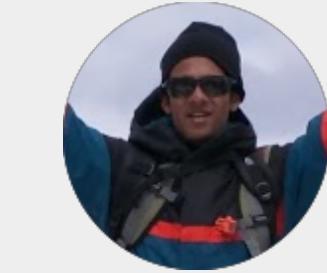
sword	13
honor	9
drink	9
khaleesi	8
must	8
hand	7
half	7
fine	7
stop	7
years	6



Fred Hohman

fredhohman.com

fredhohman@gatech.edu



Sandeep Soni

sandeepsoni.github.io



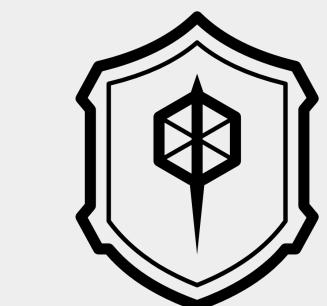
Ian Stewart

ianbstewart.github.io



John Stasko

www.cc.gatech.edu/~stasko



Georgia Tech Visualization Lab

Polo Club
of
DATA SCIENCE

We thank the members of the GT Visualization Lab and the anonymous reviewers for their constructive feedback.

Thanks!