

SenseShare: Investigating Biosignal Sharing



Max T. Curran
Computer-Mediated Communication
Spring 2016

Biosignals in Technology

FitBit (accelerometer, heart rate sensor)

Apple Watch (accelerometer, heart rate sensor)

Samsung Gear (accelerometer, heart rate sensor)

Basis Peak (accelerometer, heart rate sensor, galvanic skin response, temperature)

Empatica E4 (accelerometer, heart rate, pulse, galvanic skin response, temperature)

What if we shared these signals with others?

Problem & Theory

Disconnectedness, loneliness, and technology's "assault on empathy" (Turkle)

Social support and closeness in computer-mediated environments with low presence of informative cues and channels (Bos)

The need for context in understanding biosignals (Slovák)

Relevant Framework

Presentation of Self (Goffman)

Signals, Cues, Meaning/Cues Filtered Out+In (Donath/Walther)

Media Richness Theory

Approach

6 interviews conducted (2 female, 4 male), 20-30 minutes each

Meant to be generative

Current sharing habits

Exposure to prototype + think aloud

Post-exposure questions

Discussion of example

Future experimental work

Current Habits

Platform: Facebook (4), Facebook Messenger (1), Snapchat (1)

Why use? Maintain in-person relationships (5), share or spread information (5), update others on life changes (3), learn about others' updates (2), make new friends/connections (2), receive reactions from others (1)

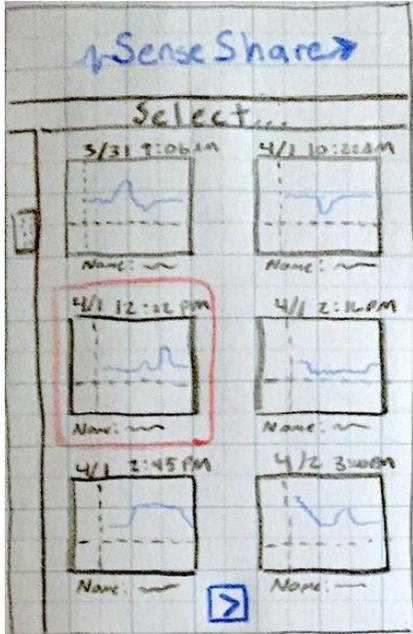
How many do you share with? A few people/small groups (4), one-to-one (3)

Who? Close friends (4), work/school colleagues (4), family (2), acquaintances (1)

On exercise tracking/sharing: “Motivate others and share my journey.”

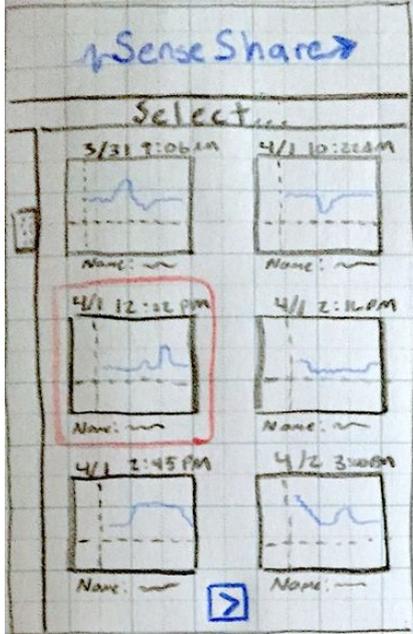
Conceptual Design Prototype

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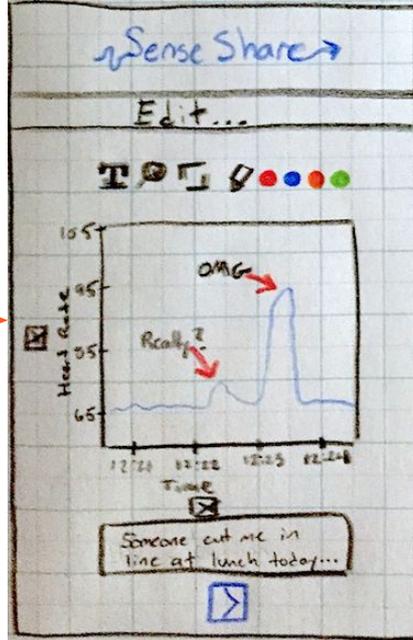


1. Select

Conceptual Design Prototype

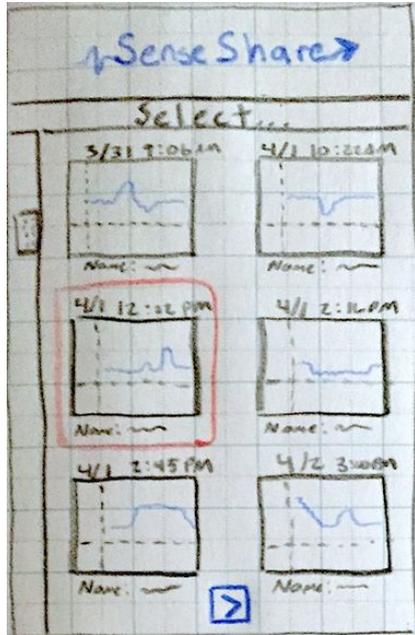


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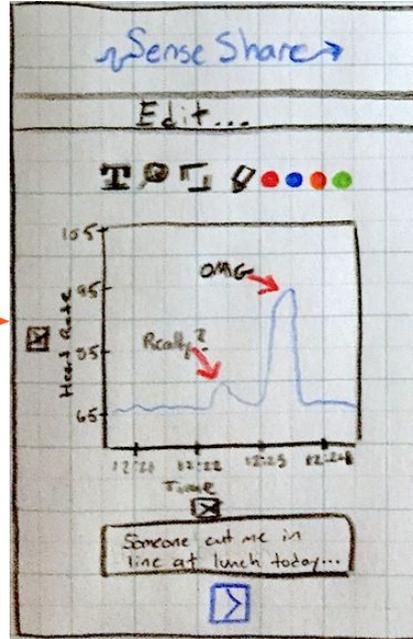


2. Annotate

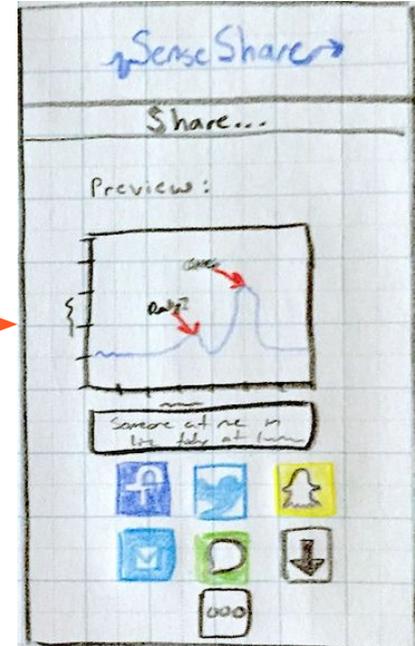
Conceptual Design Prototype



1. Select



2. Annotate



3. Share/save

Interview Takeaways

1. Generally would only want to share within close relationships
 - a. “Given someone relatively close to me and I have context, not random people, but a shared circle in a group I think it’d be cool to share with them”
 - b. “There might be other things I might share with more um... more um... intimate friends that I wouldn’t share on Facebook”
2. Personal reflection
 - a. “I’d be interested to see before a stressful event and compare that with what my levels were afterwards”
 - b. “If I could go back over my day and know when my heart rate rises, that would be really interesting for myself”

Interview Takeaways

3. Providing a sense of truth

- a. “It would be the best thing ever if I told my friends I saw this really hot chick today and then like look my heart went racing when I saw her, I would love to be able to do that it would be so awesome”
- b. “I could see how it can be a way to demonstrate my emotions, like hey look how frustrated I really got when someone cut me off, I’m not just playing around”
- c. “It’s authentication, like see I really did do my pushups this morning”

4. Foster empathy, understanding, but also competition

- a. “It’s like supplementary information to sort of make the experience more real to the other person”
- b. “The lower your heart rate is, the healthier your heart, I think I might get competitive in that regard”
- c. “To gain insight into something we wouldn’t know otherwise, and to do it together, there is the comparative part, to be able to talk about it”
- d. “This is what it felt like to cross the finish line”

Interview Takeaways

5. Positive spin to share with others

- a. “Whenever I share, even if it’s a negative thing, I’m gonna share it in a positive way”
- b. “If they were funny in a way I might share them”

6. Importance of annotation

- a. “I think I would mostly be interested in [others’] annotations. If I saw someone’s heart rate without an annotation I wouldn’t feel comfortable inferring too much about what the signal meant to them”
- b. “When it becomes annotated it adds a personal story to it, I think that would contextualize the information a little more”
- c. “Once it becomes too ambiguous it would be like what am I looking at? I don’t really care for this”

Interview Takeaways

User-generated use case ideas:

“Like if I had a presentation due I’d be like look at my heart rate, I’m so tense right now”

“If someone smokes up and then were like dude I was so high today look at my heartbeat, how low it was - that would be so fun to show people”

“Maybe you’re both at a concert and you’re both so hyped that your favorite artist is gonna come out”

“What about when I’m just checking my e-mail, or doing something sexual, I probably wouldn’t share all of those, obviously, but I’d use it as a self-exploration tool”

“When I’m talking to my girlfriend I could show her how excited I am to talk to her or when I get a text from her - like hey I really am excited”

Idea in Practice

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SPOILER WARNING!

Game of Thrones

Season 1 Finale

Idea in Practice

SPOILER WARNING!

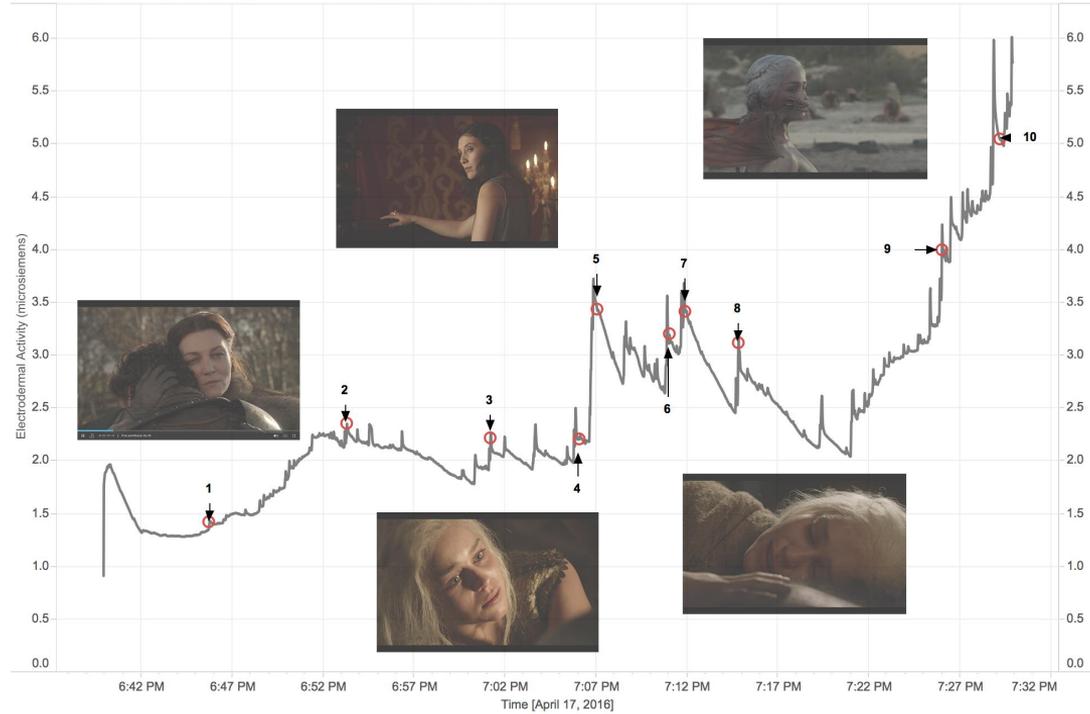
Game of Thrones

Season 1 Finale

(5 years old, c'mon)

Idea in Practice / I love Daenerys

Electrodermal Activity During Game of Thrones Season 1 Finale



1. Catelyn confronts Robb about Ned's execution
2. Robb's "King of the North" speech to his bannermen
3. Daenerys wakes to learn her baby was stillborn
4. Sam tries to stop Jon from abandoning the Night's Watch
5. Shae makes a sarcastic joke, upset by Tywin's description of her

6. Daenerys talks to a comatose Khal Drogo
7. Daenerys smothers Khal Drogo
8. Ros makes a joke about Maester Pycelle's babbling
9. Daenerys gives a speech to her followers before walking into a pyre
10. Daenerys emerges unharmed from pyre with three hatched dragons

Idea in Practice / I love Daenerys

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tracy

In preparation/out of impatience for the premiere of season 6 this Sunday I've been re-watching the old seasons of Game of Thrones.

For the season finale of season 1 I recorded my electrodermal activity throughout the episode. Electrodermal activity is a measure of skin moisture, which is triggered by the sympathetic nervous system. While the meaning of this signal isn't fully understood or straightforward, it's generally used as an indication of sympathetic emotional response or arousal (not limited to the sexual sense).

Let me know what you think! Maybe I'll record for the premiere too. 😊

Tag Photo Add Location Edit

Like Comment Share

and 15 others

Max Curran Basically, I consider this proof of my love for Daenerys.

Like Reply 2 April 22 at 7:38pm

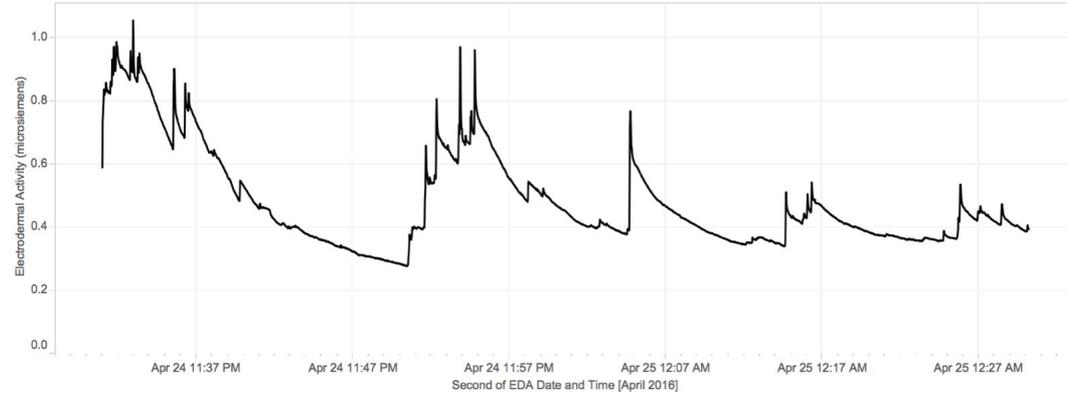
She is my spirit animal.

Like Reply April 22 at 11:22pm

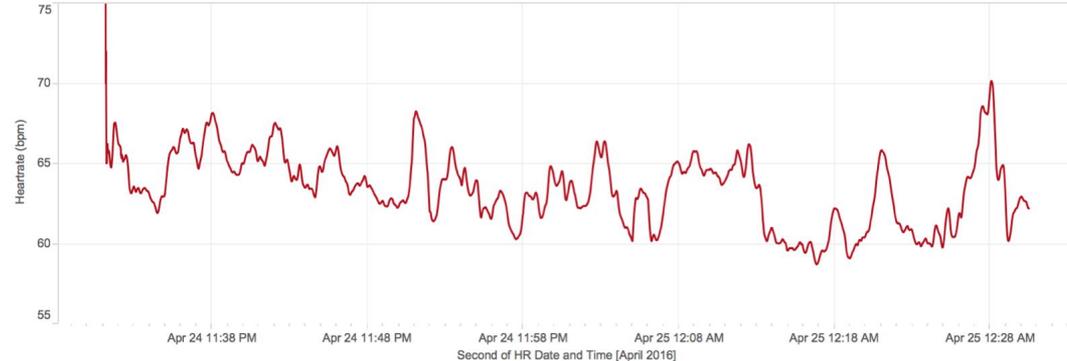
Write a comment... 📷 😊

Idea in Practice / I love ?

Game of Thrones Season 6 Episode 1 Electrodermal Activity

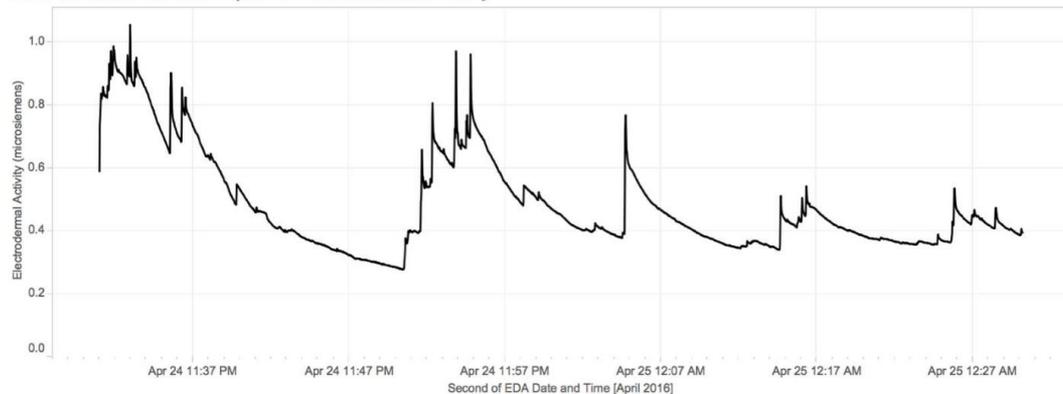


Game of Thrones Season 6 Episode 1 Heart Rate

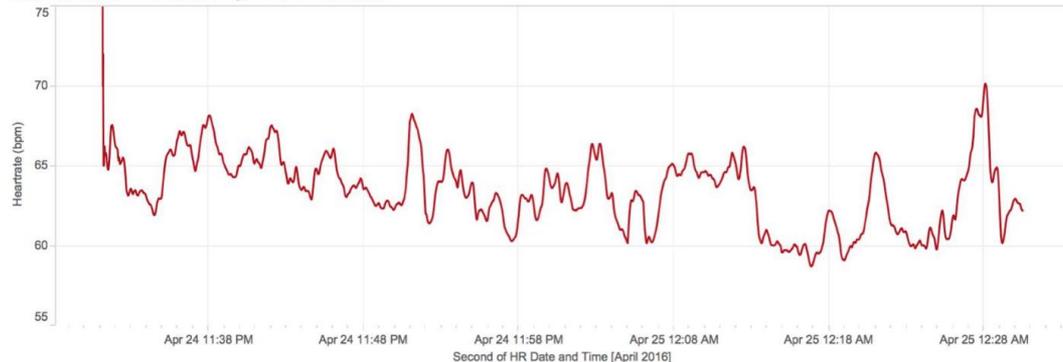


Idea in Practice / I love ?

Game of Thrones Season 6 Episode 1 Electrodermal Activity



Game of Thrones Season 6 Episode 1 Heart Rate



Max T. Curran

Tag Photo Add Location Edit

Like Comment Share

and 28 others

How did you measure this? This is awesome.

Like · Reply · April 25 at 4:21pm

Can you send me one of these machines?

Like · Reply · April 25 at 4:26pm

Max Curran I used an Empatica E4 wristband I'm borrowing from my advisor. Think they're made at MIT - you're closer to the manufacturer than I am : P

Like · Reply · 2 · April 25 at 4:49pm

Sooo John snow is alive then?! JK NO SPOILERS.

P.S. How'd you get those readings? I want that app

Like · Reply · April 25 at 6:33pm

replied · 1 Reply

Oh my. this could become a new sport in our house...

Like · Reply · April 26 at 11:55pm

Write a comment...



Reactions

“You seem to have enjoyed the entire episode” / “Oh Max was experiencing this then”

“I think this makes it like oh I wanna watch that, this allows you to do a no spoiler post”

“I remember thinking it was really cool,. it made me think of on SoundCloud people post music and then people will have reactions at different points in the song and you can see them all”

“I do like the annotation because I think it adds that layer of what you expected versus what you actually got, it was interesting when the spikes didn’t line up with what you thought was happening”

“There’s a scene in the Avengers when the Hulk says “My secret is I’m always angry” - the first time I watched that I was so excited and I couldn’t even tell people how excited I was so I could see doing this”

“I watch Once Upon a Time, that’s something that just gets my emotions raging for some reason - it would be better to have data to back it up, instead of just trying to sound cool like “oh this part was so emotional””

Caveats & Limitations

Pre-existing notions or misunderstanding of signals

“I think heart rate would be the most fun, and the most interesting to share - something that everyone could understand”

“I think GSR is easier to interpret because it’s a spike up or down... with heart rate it’s variability that matters..?”

Privacy and security

“Even sharing this conceptual thing about yourself, if you aren’t secure end to end who’s receiving it, that disturbs me a bit”

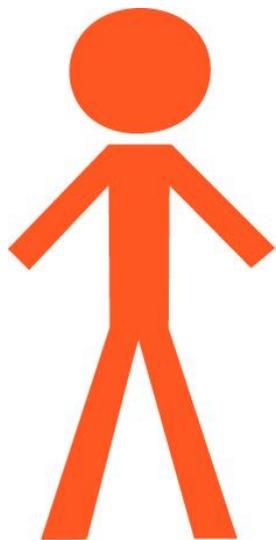
Caveats & Limitations

Limiting the human experience

"It's like seeing a shadow of a puppet of a horse. We experience things massively filtered through our own and other people's emotions. It's all shadows. We can make guesses but we don't really know. This is another signal, it's not the truth, I think it is very interesting and could prompt a lot of interesting discussions."

Sensor limitations and flaws

Future Work



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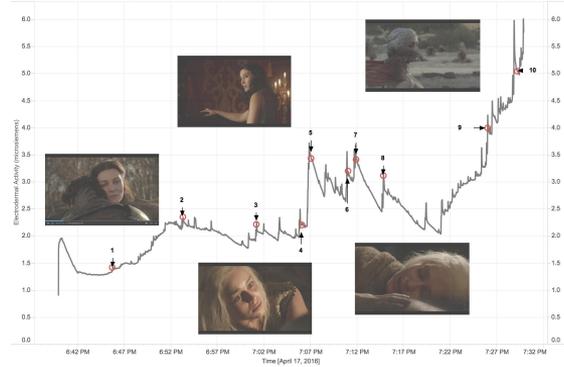


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Future Work

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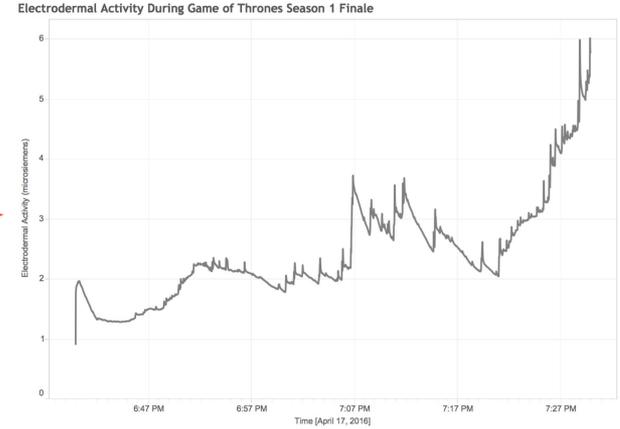
Annotated Signal

Future Work



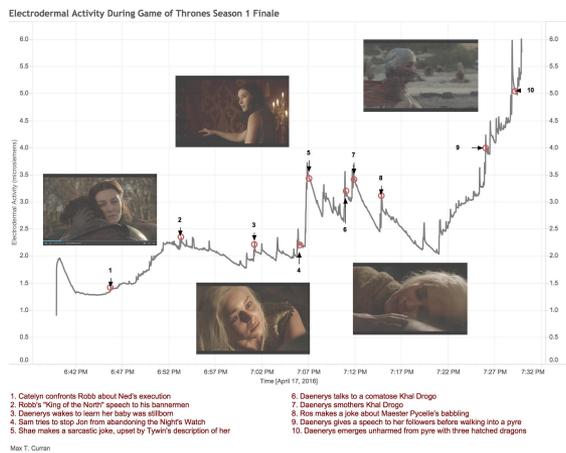
Annotated Signal

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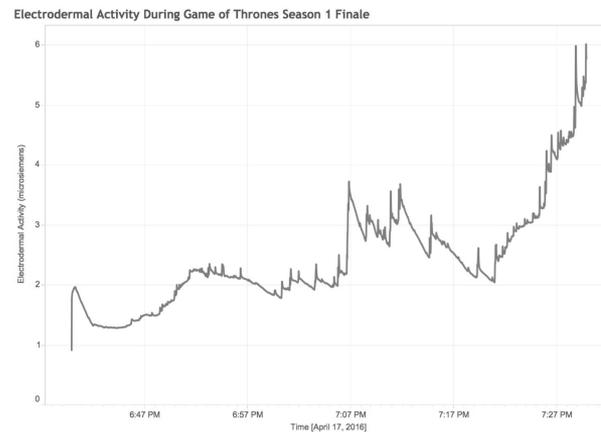
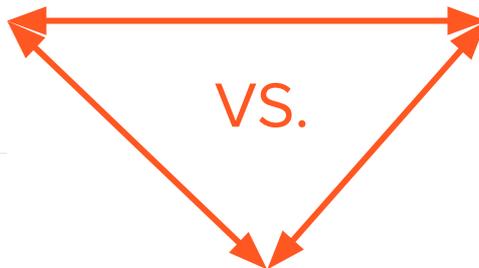


Signal Only

Future Work



Annotated Signal



Signal Only

Just watched the GoT season finale!! So sad when Cat & Robb find out Ned was executed. I cheered up at Shae's sarcasm with Tyrion about her profession... but then OMG Daenerys & Khal Drogo I almost cried!! She's way too badass to let that stop her though - walking into fire and hatching dragons whaaaaaaaaa???

Annotation Only



Questions?