Eye Tracking and Image Evaluation
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Goal: To investigate participant attention and emotional responses using eye-tracking technology, focusing on visual stimuli presented through the map "Arctic Sea Ice Decline," and to analyze how participants interacted with map elements, particularly the legend and defined Areas of Interest (AOIs).

Objective:

- Utilize RealEye software to track participant eye movements while interacting with the visual stimuli.

- Assess the attention distribution using heatmaps and determine which map elements garnered the most focus.

- Analyze emotional fluctuations and engagement levels based on eye-tracking data.

- Evaluate the quality and integrity of the eye-tracking data to ensure accurate and credible results.

Findings:

The information seems to come from research where some participants had their eyes tracked. Presenting visual stimuli and utilizing RealEye software to measure eye movements were probably part of the investigation. I wanted to investigate if the participants could identify the differences by looking at the map's legend, which changes color. I also wanted to know which area they concentrated on when conducting the poll. I wanted to check how much care they were taking when administering the survey. I therefore created the questionnaire according to what I wanted to observe throughout the entire survey.

The regions of the "Arctic Sea Ice Decline" map that caught the viewer's attention are shown by the eyetracking movement displayed in the picture.
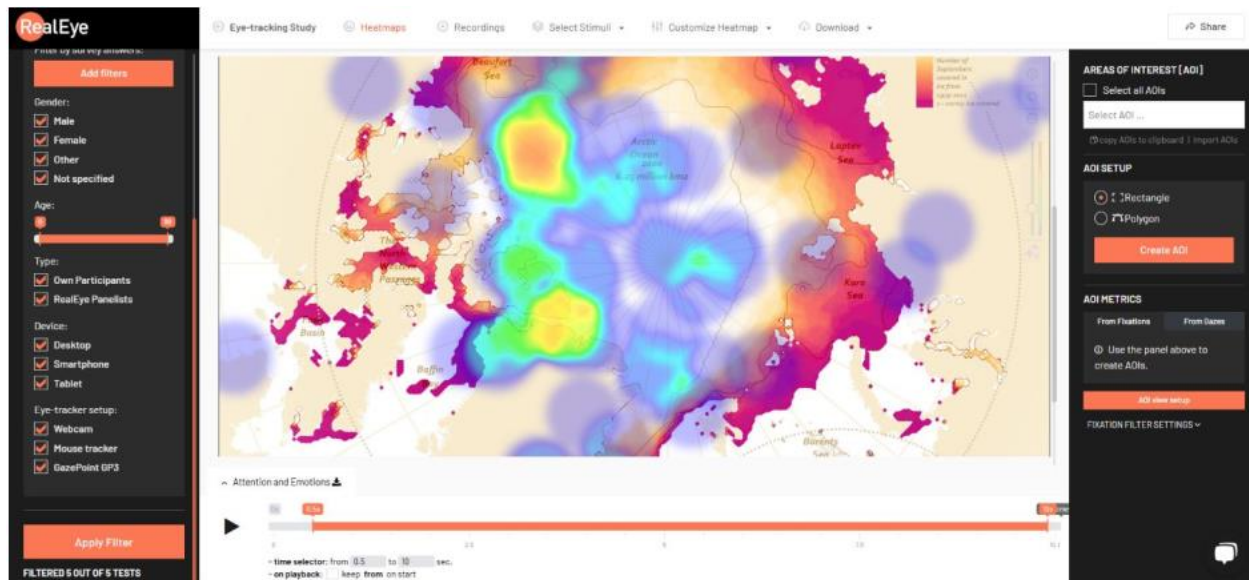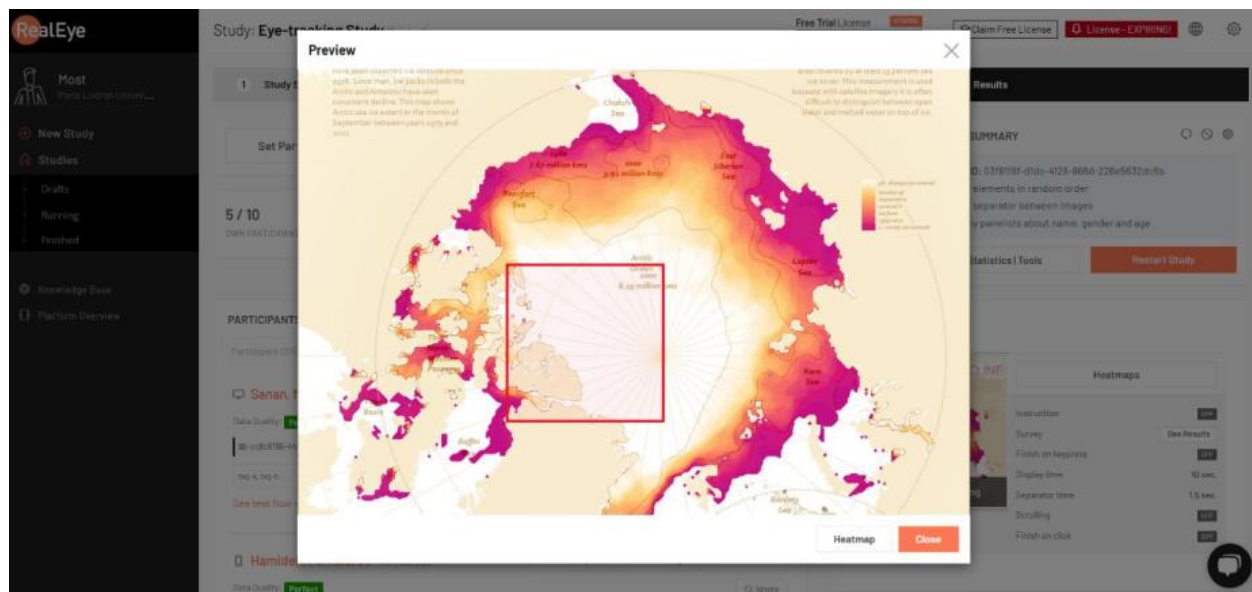
Heatmap

Heatmap – Attention map

The heatmap shows the visual representation of where participants draw their attention mostly while conducting the survey.

The area spotted with yellow and red shows that the viewer gaze was frequently more fixated.

Cooler tones such as blue and green shows that on the area they had less attention.

Areas of Interest (AOIs)

The study seems to have defined specific Areas of Interest (AOIs). I set the marked area as an area of interest regions that the researchers were interested in tracking participant attention. On the picture of the heatmap it represented by the color with warmer tone of AOIs. The data of the eye-tracking gives important information how the participants engaged with the map named "Arctic Sea ice Decline". It uncovers about the studies that was noticeable and interesting to the participant, offering a window into their cognitive processes and attentional patterns.
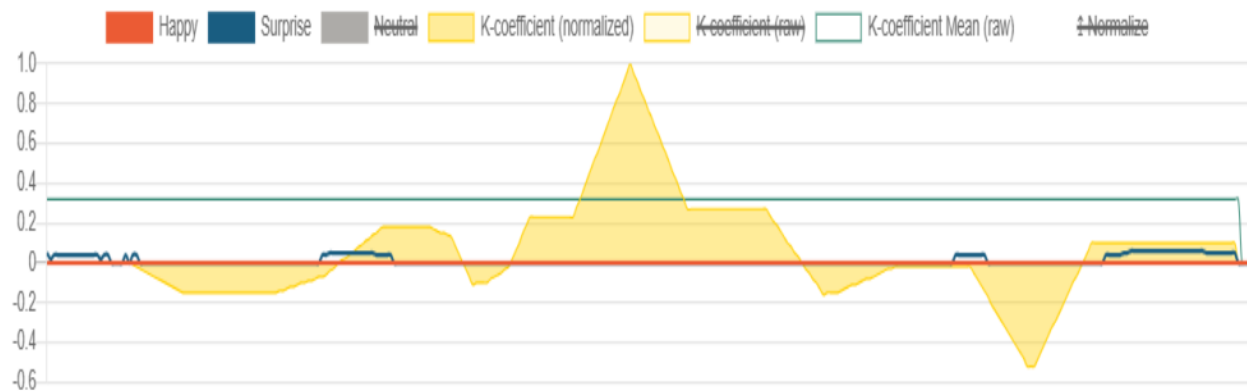
The provided chart indicates the visualization of emotional responses of the participants during the survey, measured using eye-tracking data. Here's a breakdown of what the different elements shows:

Emotional Fluctuation: This graph shows the line for "happy" and "surprise" vary over time. It shows the emotional state of the participant which varied in response to the stimuli

High Arousal data: The peak point in the k-coefficient shows the higher emotional engagement. This is impactful moments in the stimuli while analyzing the data.

Overall Situation: The mean of K-coefficient represents a baseline for comparing the data. Where the Kcoefficient exceeds shows the heightened emotional response of the viewer.

Emotional Engagement:

Graphs depicting emotional fluctuations showed variability in responses, with peaks in the k-coefficient representing heightened emotional engagement during impactful visual moments.

The analysis captured participant emotions such as "happy" and "surprise," demonstrating the stimuli's effect on viewers.

E-T Data Grade	Eye-tracker Log	E-T Data Integrity	Gaze On Screen	E-T Sampling Rate	"Gaze vs Click" Accuracy	Display Resolution	
Perfect	OK	99%	100%	29 Hz	N/A	1280x720 px	Physical: 1920x1080 px	Quality Stats	Logs
Perfect	OK	100%	100%	72 Hz	N/A	390x663 px	Physical: 1170x1989 px	Quality Stats	Logs
Perfect	OK	99%	100%	31 Hz	N/A	393x824 px	Physical: 1081x2266 px	Quality Stats	Logs
Average	OK	100%	77%	32 Hz	N/A	393x736 px	Physical: 1081x2024 px	Quality Stats	Logs
Very Good	OK	97%	99%	30 Hz	N/A	360x704 px	Physical: 1080x2112 px	Quality Stats	Logs

Participant-specific Data:

For the participants the table shows some differences:

E-T Data Grade: The rating provides the quality of the eye tracking data for the specific participant. Most of them voted their response as "Perfect"

Eye-tracker Log: This likely indicates whether the eye-tracking data was recorded properly and without significant issues.

E-T Data Integrity: This shows the percentage the participant's gaze was tacked by the eye-tracked perfectly.

Gaze on Screen: This data shows that the involvement of the viewer's gaze on the screen was accurate during the study

E-T Sampling Rate: This indicates the different frequency at which the eye-tracker recorded the viewer's gaze.

Gaze vs Click: It's not applicable during the study.

Finally, the chart provides a glimpse of the quality and credibility of the data collected from the participants. This data is helpful to access the suitability for further exploration and interpretation.

Insights on Viewer Interaction

The study highlighted participant attentional patterns and emotional responses, offering a deeper understanding of how map elements influence viewer perception and engagement.

Conclusion: The eye-tracking survey provided valuable insights into participant attention and emotional responses to the "Arctic Sea Ice Decline" map. The use of heatmaps and AOIs revealed key areas of interest, while emotional analysis added depth to understanding viewer interactions. The high-quality eye-tracking data ensures the credibility of findings and supports further exploration into visual cognitive processes.