Requirement Gathering for VisCoMet

Supplementary Material for
"VisCoMET: Visually Analyzing Team Collaboration in Medical Emergency Trainings"

Before developing the VisCoMet approach, we (the visualization researchers) had meetings with the collaborating social interaction researchers to understand the scenario and the dataset. This gave us a rough idea about the expected goals of the system, summarized in the slide below:

Goals of the System – So Far

- Display the annotations of training videos
- Enable
  - Exploration of Annotations
  - Comparison of different triage trainings
- Support the creation of hypotheses
  - (By taking notes?)

While there were several ideas by the social interaction researchers, they were a bit vague. Hence, as a first step to have a more concrete description of feature requests, in a meeting, we presented the following slides to the social interaction researchers:

What do you want to use the system for?
What features would give you the most benefit?
What are essential features for you?

Let's Create Some Goals

As a (Who)

I want to (What)

So I can (Why)

This resulted in a list of feature requests with concrete descriptions, shown in Table 1. Then, the social interaction researchers were asked to rate the priority (on a scale of 1-10, where 1: not important, 10: most important) of each feature request. The result is shown in the table. Next, we grouped the feature requests into three broad requirement categories (R1, R2, and R3) for the visualizations. The mapping between each feature request and the requirement is shown in Table 1. The three requirement categories are:

R1: Session Details
 The approach should visualize all details of a session: a) the video, b) the annotations and their properties, and c) the triage decisions in contrast to the ground truth.

R2: Comparison
The approach should enable comparison a) of parallel events (across tiers) in one session and b) similar temporal event patterns between multiple sessions, c) enable finding similarities and differences among the sessions, and d) convey an overview of teams' activities.

R3:Workflow
The approach should a) enable the look-up of annotations in the corresponding video, b) enable documenting findings, and c) support the definition and highlighting of interaction patterns between team members.

Table 1: List of feature requests gathered from interviews with the social interaction researchers. (Priority scale: 1: not important, 10: most important)

ID	Feature Requests	Reason	Priority	Mapped Requirement
0a	The system should be able to import annotations from ELAN in a specified format and their corresponding videos.	- To get the data to visualize and show	10	R3
1	The system should display the related video or timecode to the particular annotations/ data point.	- To review and explore the scene at a particular annotation - Verify the annotation	10	R1
2	The visualizations should include the temporal triage status	- To make changes visible	8	R1
3	The visualization should include the correct triage and teams triage result for each case.	- To find cases where the triage result was incorrect → find possible error sources	8	R1
4a	The visualization should enable comparison of distinct triage cases		8	R1
4b	The visualization of the particular triage case should not only contain the result but also when the category was changed.		7	R1
5a	Entire triage trainings should be selectable.		8	R3
5b*	Specific Annotation lines (tiers) should be selectable.		8	R1*
6a	The overview visualization should highlight similarities and differences between the triage cases [as examined by different teams].	- Enables comparison	8	R2
6b	The system should communicate show the similarity is computed and show the distinct values.	- To foster transparency and understanding of the computation	8	R2
6c*	It should be possible to define, which annotation characteristics are used in the similarity computation.	- To test different Hypotheses - Because it is currently not known how to define similar cases	8	R2*
7a	The system should communicate specific		6	R3

	patterns between the different persons.			
7b	It should be possible to define, which sequences/ occurrences of annotations are detected as a pattern.		7	R3
8	The overview visualization should contain an aggregation of each person's activity.	- How much is going on for each person	6	R2
9a*	The system should enable the creation of categories based on the uploaded annotations via selecting characteristics of annotations and naming the category.	- Enables the analysis and exploration of hypotheses	7	R3*
9b*	The selection of created categories should result into a highlighting in the visualizations.		6	R1*
10a	Markers should be stickable to the visualizations.	- To mark interesting points	7	R3
10b	It should be possible to name the markers.		7	
10c	It should be possible to insert a description to the markers.		4	
10d	It should be possible to change the maker's icons. (~4 different icons)		3	
10e	It should be able to change the marker's colour.		5	
10f	A history of the markers should exist, showing their temporal order.		7	
11	All new data should be exportable in form of a table including their values (e.g. markers position, similarity values) and their IDs.	- To use them in reports/analyse them in another tool.	10	

While developing the prototype, regular feedback meetings were conducted with the social interaction researchers. Some feature requests (marked with a star) remain unimplemented in the prototype of our approach, explained as follows:

- 5b: Specific Annotation lines (tiers) should be selectable
  As the request mainly originated from the need to accommodate more than one training session in one screen without scrolling, in the visualizations of usual analysis tools used by the researchers. Since the proposed timeline design solves the issue

with compact yet readable encoding, implementing the requested feature was not necessary anymore.

- 6c: It should be possible to define, which annotation characteristics are used in the similarity computation
  Due to limited time, it was not possible to extend the interface and include interactively modifying the similarity computation formula. Although not directly possible in the interface, the formula for similarity computation can still be modified in the code. For default computation, the current formula for the computation is based on the feedback of the social interaction researchers, where they highlighted the parameters that are necessary and relevant for them to compute similarity in terms of collaboration dynamic between different teams.

- 9a: The system should enable the creation of categories based on the uploaded annotations via selecting characteristics of annotations and naming the category.
- 9b: The selection of created categories should result into a highlighting in the visualizations.
  The two feature requests demands introduction of a data model layer between the dataset and visualization which can be interactively modified by the user. Any change in the data model would need to be reflected in the visualization. Although such features would result in a more generalized approach, implementing them was beyond the scope of this work. However, we see a potential value in the feature requests and are discussing about the possibilities of follow-up work in this direction.