Visualization of Biological Data - From Analysis to Communication

Agenda Outline and Guiding Questions for Panels

Note: Please note that all Dagstuhl agendas are extremely tentative, and that radical modifications are expected after the first on-site meeting.

Monday morning: Introduction and Collaboration / Communication through New Tools
8:45-9:00 Welcome and Overview (Karsten and Kay)
9:00-9:45 Introduction of every participant (Wiki, recorded)
9:50-10:30 *Panel (part 1): Collaborations (5 mins) - moderator Timo*
     Liz Marai, Marc Streit, Jim Procter, Timo Ropinski
     Suggested Questions for Panel:
- How do we find collaborators?
- What are the incentives for this type of collaboration (researcher-level and community-level)?
- How do we establish awareness of what vis can offer? (not just ML and stats)
- How to work with a visualization or a biology researcher?
- What is the cost of maintaining a deployed tool?
- How do we measure success (e.g., biologists cite the site or tool name, not the paper describing the tool) ?
- How can visualization (human in the loop) be "sliced" into analysis pipelines (like Unix pipes)?

10:30-11:00 Coffee Break
11:00-11:40 *Panel (part 2):* Marc Streit, Jim Procter, Timo Ropinski - moderator Kay
11:45-12:15 *Overview Talk: (20+10 min.): Collaborations - session chair Kay*
     Katy Borner/Andi Bueckle
12:15-13:45 Lunch *(task: discuss goals and outcomes of breakout groups)*

Monday afternoon: Collaboration (cont'd) and Interactive Analysis
13:45-14:15 *Regular Talks (10+5 min. local discussion) - session chair Karsten*
     Alex Lex, Danielle Szafir *(recorded/live)*
14:15-15:15 *Overview Talk (20+10 min.): Interactive Analysis - session chair Karsten*
     Nils Gehlenborg
15:15-15:30 Planning for breakout groups (collection of subtopics until sunday evening) -
Karsten
15:30-16:00 Afternoon Coffee Break

16:00-17:15   *Group Work: Collaboration or Interactive Analysis*
                 Breakout session
                 Working Group 1: (Chair:)
                 Working Group 2: (Chair:)
                 Working Group 3: (Chair:)
                 Working Group 4: (Chair:)
17:30-18:00   Updates from working groups - session chair Karsten

18:00-19:00   Dinner
19:00-20:00   Open discussions, beer/wine (honor system), music
20:00-22:00   Cheese platter

Tuesday morning: Interactive Analysis (cont'd) and Data Abstraction
8:45-10:00   *Panel: Interactive Analysis (5 mins.)*
                 Jan Aerts, Bruno Pinaud, Falk Schreiber, Andreas Kerren
                 Suggested Questions
                 - What are good and bad examples (tools, methods)?
                 - What are the killer applications for interactive data visualization in this space?
                 - How do you serve the needs of a broad spectrum of users?
                 - How do you integrate into existing, complex data ecosystems?
                 - Who are the key influencers in this field who could promote interactive data visualization?
                 - How could interactivity be published to convince reviewers and more so future users: use cases for "bench marking" or similar?
                 - What challenges/open unsolved problems are faced in the future? E.g.
                     - Do we need new /better visual encodings?
                     - How can multivariate/multimodal big data and interactive visualisation be better integrated?
                     - Data security issues (medical/patient data) and interactive data vis?

10:00-10:30   *Regular Talks Interactive Analysis (10 mins + 5 local discussion)*
                 Will Ray, Charlotte Soneson (recorded/live)

10:30-11:00   Coffee Break
11:00-11:30   *Overview Talk: Data Abstraction* Larry Hunter (recorded)
11:30-12:15   *Regular Talks Data Abstraction (10 mins + 5 local discussion)*
                 Miha Štajdohar, Steven Koburov, Lynda Hardman (live/recorded)
12:15-13:45   Lunch

Tuesday afternoon: Data Abstraction (cont'd)

13:45-15:00   *Panel: Data Abstraction (5 mins.)*

                 Michael Krone, Karsten Klein, Granger Sutton

                 Suggested Questions

- What current challenges and use-cases require or could benefit from data abstraction?
- Which methods and metaphors can we use for abstraction?
- Which evidence exists for usability of existing methods?
- How can we evaluate quality and usability of abstraction?
- What are challenges and pitfalls in the use of abstraction?
- What are good and bad examples (tools, methods)?
- What is the interplay of visual data abstraction and data aggregation?
- What is the role of different levels of abstraction and how to combine them?
- How can we better integrate semantics into visual data abstractions?

15:00-15:30   Planning session for working group distributions

15:30-16:00   **Afternoon Coffee Break**

16:00-17:30   **Breakout session**

                 Working Group 1: (Chair:)

                 Working Group 2: (Chair:)

                 Working Group 3: (Chair:)

                 Working Group 4: (Chair:)

17:30-18:00   Updates from working groups

18:00-19:00   **Dinner**

19:00-22:00   Open discussions, beer/wine (honor system), music

20:00-22:00   **Cheese platter**

Wednesday morning: Curriculum

8:45-10:30   *Overview Talk (30 mins)* Torsten Möller, Barbora Kozlikova

                 Working Group All: A curriculum for visualisation

10:30-11:00   **Coffee Break**

11:00-12:15   Breakout Session: Working Groups continue

12:15-13:45   **Lunch**

Wednesday afternoon: Explainable AI

13:45-14:15   *Overview Talk:* Cagatay Turkay

14:15-15:30   *Panel: Explainable AI (5 mins.)*

                 Guadalupe Canahuate, Hagit Shatkay, Katja Buhler, Blaz Zupan

                 Suggested Questions

- What is the role of visualization in XAI?

- Are visualization-based XAI methods general, or are they used to target specific machine learning models and approaches?
- What are the typical visualization methods and metaphors we can use for XAI?
- How do visualizations that explain machine learning models address reliability? Do visual explanations reveal how reliable models are? Is there a danger of explaining unreliable models and being carried out by the beauty of visualization?
- Can visualizations explain only simple models, or can they reveal more complex feature interactions? If, in what way?
- How do we integrate semantics, or background knowledge, in visual explanations? For instance, how can we combine data and ontology information about concepts and terms?
- How close are visual explanations to those that a human would craft?
- What are the challenges in evaluating visual explanations?
- What are the historical roots of visual explanations? Are there typical visual explanations already invented, or does XAI require new visualization metaphors that stem from explaining deep models?
- Do we need to explain deep models, or should we build simpler models that directly translate to visual explanations?

15:30-16:00	***Coffee Break***
16:00-17:00	*Regular Talks:* Carsten Gorg, Mennatallah El-Assady, Raghu Machiraju
17:00-17:30	Assembly of all: report on progress in working groups
17:30-18:00	Free time, self-organize or have a walk...
18:00-19:00	***Dinner in Dagstuhl***
19:30-22:00	Open discussions, beer/wine (honor system), music
20:00-22:00	***Cheese platter***

Thursday morning: Hiking and Biking (for participants on site)

12:15-13:15   Lunch

Thursday afternoon: Breakout cont'd

13:45-15:30	**Breakout session**
	Working Group 1: (Chair:)
	Working Group 2: (Chair:)
	Working Group 3: (Chair:)
	Working Group 4: (Chair:)
15:30-16:00	***Afternoon Coffee Break***
16:00-16:30	***Group photo on castle steps***
16:30-17:30	Breakout Session cont'd

17:30-18:00   Results of Working Groups, Plenary discussion
18:00-19:00   Dinner
19:00-20:00   Open discussions, beer/wine (honor system), music
20:00-22:00   Cheese platter

Friday morning: Wrap ups
9:00-10:30   First morning session - Wrap up / finalize writing
10:30-11:00   Coffee Break
10:30-12:00   Second morning session - Wrap up / finalize writing
12:15   Lunch and end of seminar
Afterwards   Departure