PA214 Visualization II / Seminar #1

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Seminar 1 – project topics

HCI LAB VISITlab

Who we are?

- Katka Furmanová
  - Visualization research, 1 year PostDoc at TU Wien
- Honza Byška
  - Visualization research, 4 years of PostDoc at University of Bergen
- Vítek Rusňák
  - HCI/Vis Researcher in the CSIRT-MU at the Institute of Computer Science
- Bára Kozlíková
  - Head of visitlab, research in visualization, namely in biochemistry, criminology, geology, ...

How this will look like?

- We will give you a list of topics to choose from, you can come with your own topic as well
- You can work individually or in groups
  - The number of people in the group will influence the required complexity of the final solution
  - We slightly prefer team projects ;)
- You will follow the workflow used in the visualization research
- The main goal is to **understand what it means to do a research in visualizations**

How to get the points?

- 5 tasks, for each you can get maximally 10 points
- Minimum for each task is 3 points to pass
- Minimum for passing the whole course is 26 points in total
    - 50-46 points ..... A
    - 45-41 points ..... B
    - 40-36 points C
    - 35-31 points ..... D
    - 30-26 points ..... E
    - 25-0 points ..... F

Tasks

- Task 1: Related work research, analysis of task requirements, parsing the data, preparing the sketch of the initial design
  - *10 points for initial sketches and parser*
- Task 2: Finalizing the design, starting with implementation
  - *10 points for final design*
- Task 3: Finalizing the implementation
  - *10 points for implementation*
- Task 4: Presenting the result
  - *10 points for presentation*
- Task 5: Writing the project report
  - *10 points for report*

Topic 1: Open Data Brno

- The Open Data Brno portal contains various public datasets and for many of them, you can find also their visual representations on their webpage. However, many of them are not appropriate. One example is the map of movements of citizens, captured from the data from mobile operators. The dedicated visualization is available here:
  - https://data.brno.cz/app/41bd778ef2e24f8d985cd54a963ce7a6

- The problems of this representation are more than obvious ☺
- The goal is to identify the main issues of the existing representation, suggest suitable changes, and implement the improved version

Topic 2: Explainable AI for Digital Pathology

- Team lead by associate professors Petr Holub and Tomáš Brázdil research application of AI methods in digital pathology. Their current goal is to support pathologists with the detection of cancer cells in gigapixel optical microscope imagery.
- There are multiple tasks where visualizations can help, ranging from comparing the algorithm performance to extending their current tool with visualizing false negatives/positives results.
- In case of interest, we arrange a follow-up meeting to discuss particular topics in details.

Topic 3: NASA Data Visualization

- **NASA has many datasets publicly available**
  - https://data.nasa.gov/browse
- Browse the datasets, select one (or combine more of them), and design your visualization for that

Topic 4: The Kronos Incident

VAST 2021 Challenge

- Design visual analytics tools to help with investigation of GAStech employee kidnapping. Discover relationships, anomalies and suspicious activities. You can choose from 3 mini-challenges:
    1. **Relationships** analysis based on news reports, resumes of employees, and email headers of internal GAStech company emails.
    2. **Movement/tracking** analysis based on car tracking data for the two weeks prior to the disappearance, credit card transactions and loyalty card usage data.
    3. **Social media** and text analysis based on collection of microblogs and emergency calls from the days surrounding the disappearance.

https://vast-challenge.github.io/2021/description.html

Topic 5: Disaster at St. Himark

VAST 2019 Challenge

- Design visual analytics tools to help emergency services in understanding and managing the situation after earthquake in a city with nuclear power plant. You can choose from 3 mini-challenges:
    1. **Identify areas of concern** based on citizen reports from damage reporting app and shake maps.
    2. **Analyze contamination** from power plant based on stationary and mobile sensors.
    3. **Social media** analysis to identify what the emergency concerns of the populace are.
    4. You can also fuse all the data together to get the big picture!

https://vast-challenge.github.io/2019/overview.html

Topic 6: Suicide Risk Analysis

BioVis 2020 Challenge

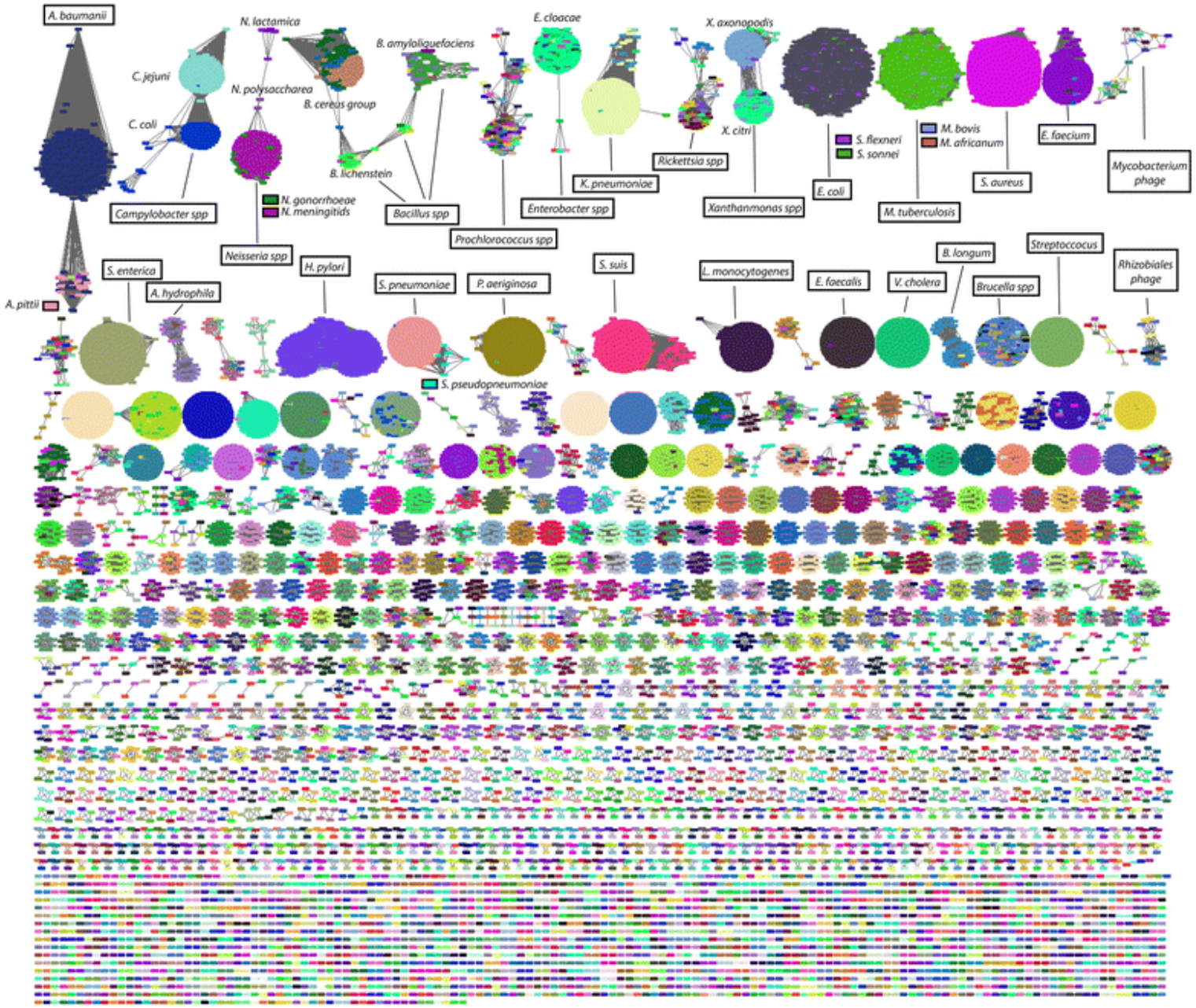
- Design visualizations to help with analysis of multidimensional clinical geneological dataset of suicide risk. The dataset contains a selection of 10 family trees with a high incidences of suicide. Each person in the datasets is associated with a wide set of attributes, including demographic and clinical information.
- http://biovis.net/2020/biovisChallenges_vis/#data-challenge

Topic 7: Tree of Life

BioVis 2019 Challenge

- Redesign of the hierarchical genomic data visualization representing relationships between different species.

- http://biovis.net/2019/biovisChallenges_vis/#data-challenge



Topic 8: It might be yours!

- **Come with your own topic**