

FIT3179 Data Visualisation

Week 12: Exam discussion



Visualisation 2 and report due **25 October, 5 pm.**

Discuss your visualisation and report with your tutor in the regular tutorial hour!

Please provide feedback.

Take 5 minutes to fill out the SETU form on Moodle.

Lecture Overview

- Obtain an insight into the final exam and preparation strategies
- Important content of each week

The exam is designed to test your understanding of the material we have covered in the lectures and applied in the tutorials.

The sample exam can give you an indication of the level of knowledge and understanding you're expected to have reached.

- You may be required to
 - Recall key facts from the course (multiple choice)
 - Explain concepts (short answer)
 - Critique a visualisation
 - Suggest improvements
 - Design a visualisation

- Review the lecture notes – they cover the key material and provide reference to the texts. Note that some weeks have two slide sets.
- The following slides provide details about what is included in the exam.
- Review the tutorial material – the tutorials are designed to cover all important areas.
- Complete all homework activities – they get you applying important concepts.
- Complete the sample exam question provided on Moodle (Week 12 page).

- The exam may cover topics from all weeks
 - Guest lecture by Maxime Cordeil is examinable.
- Focus 1: information visualisation principles
- Focus 2: demonstrate the ability to apply principles to create visualisations
- Use the lecture slides as a basis for revising content
- Chapters indicated on slides in textbook
- Required readings on Moodle
- Optional readings on Moodle deepen your understanding and expertise, but are not required for the exam.

- 5 multiple choice questions (10 marks)
 - Related to theory covered in lectures
- 12 knowledge questions (30 marks)
 - Related to theory covered in lectures
- 6 critical analysis and discussion questions (35 marks)
 - In each question a visualisation is given. Identify issues and discuss relevant theory.
- 3 visualisation of data questions (25 marks)
 - Propose an approach to visualising a data set
 - Bring coloured pencils to make it easier to draw nice visualisations.
- **NO 'CHEAT SHEET' ON THE EXAM**
 - Munzner's summaries not available on the exam
 - You should use these as revision before the exam though

- Introduction to Information Visualisation
- Choropleth maps (second slide set)
- Not in exam: The history of Information Visualisation

- What, Why, How framework by Munzner
- Data attributes
- Dataset types
- Marks and channels
 - Accuracy of channels for quantitative data
 - Visual encoding of data

- This is the most important material. Make sure you understand this thoroughly!
- Read the relevant book chapters.
- Not in exam: motion channels, sound channels

- Five design sheet methodology
- Idioms for tables
 - Scatterplot, SPLOM, bar charts, line chart, stacked bar chart, area chart, pie chart.
- Networks and trees
 - node-link diagram, adjacency matrix, treemap
- For all idioms
 - When to choose them.
 - How to design them.
 - Advantages and disadvantages.

- Data-ink ratio
- Chartjunk, debate regarding visual embellishments
- Visual narratives and storytelling
- Gestalt principles
 - Including required reading: *Gestalt principles of visual perception* by Cole Nussbaumer Knaflc (PDF on Moodle)
- Lying with Visualisations
 - Including required reading: *A Quick Guide to Spotting Graphics That Lie* (link on Moodle)

- Colour spaces (RGB, HSV/HSL, $L^*a^*b^*$, XYZ, visual equidistance)
- Effective use of colour for data visualisation
 - Colour contrast, and consistent use of colour
 - Rainbow colour discussion
 - Colour for the colour vision impaired
 - Required reading: *What to consider when choosing colors for data visualization* on Moodle
- Visual Hierarchy with Figure-Ground
- Layout
- Typography
- Label Placement
- Visual hierarchy with type

- Vis idioms
 - Isotype (including the study evaluating the effectiveness of Isotype elements)
 - Venn diagram
 - Dot plot
 - Parallel coordinates
 - Streamgraph
 - Radar chart
 - Chord diagram
 - Sankey diagram
 - Alluvial diagram
 - Network diagram
 - Polar area, polar bar and spiral plot
 - Techniques for repeating phenomena, including required reading *Visualizing Patterns on Repeat* (link on Moodle)

- Micro-Macro readings
- Map projections
 - Meridians, parallels, equator, longitude, latitude, prime meridian.
 - Map projection concept.
 - Areal and angular distortion
 - Mercator projection and web map tiles
 - Developable surfaces with typical use, and patterns of parallels and meridians on map
 - Projections for world maps (Robinson, Equal Earth, Mollweide)

- Idioms for spatial maps (second part of slides of Week 7)
- See required readings on Moodle (Week 7)
 - Dot Density Maps by axismaps
 - Choropleth Maps by axismaps
 - Proportional Symbols on maps by axismaps
 - Using Colors on Maps by axismaps

- Data classification
 - Why is it useful? What techniques exist?
 - Required reading: *The Basics of Data Classification* by aximaps
- Visualisation tools
 - Including basic understanding of HTML DOM, SVG and JavaScript

- The role of interactivity to allow greater understanding of data
- What interactivity can help with
- Techniques that can be used to allow exploration of data
- Read Munzner Textbook Chapter 11 - Manipulate View

- Guest lecture by Maxime Cordeil
 - Scatterplots
 - Dimension reduction
 - Parallel coordinate plots
 - Immersive analytics
 - ImAxes
 - Tangible interaction devices for immersive visualisation

Thank you, study hard
and Good Luck on the exam!
It will be easy if you are prepared.