DIV2IL: Data and Information Visualization

Practice Session: DataVis Project - Part 02 | AIS.ba VZ SS25

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Export Interactive Chart to HTML File

- a simple example of a stand-alone HTML document can be generated for any chart using the Chart.save method:

```
chart =
alt.Chart(iris).mark_point().encode(
    x='petalWidth',
    y='petalLength',
    color='species',
    tooltip=["species", "petalLength",
"petalWidth"]
).configure_axis(
    grid=False
).configure_view(
    stroke=None
).interactive()


chart.save('chart.html')
```

Generated HTML Code

```
<!DOCTYPE html>
  <html>
   <head>
     <meta charset="UTF-8">
     <style> #vis.vega-embed {…}
     </style>
    <script type="text/javascript" src="https://cdn.jsdelivr.net/npm/vega@5"></script>
    <script type="text/javascript" src="https://cdn.jsdelivr.net/npm/vega-lite@5.20.1"></script>
    <script type="text/javascript" src="https://cdn.jsdelivr.net/npm/vega-embed@6"></script>
   </head>

   <body>
    <div id="vis"></div>

   <script> ALTAIR SCRIPT </script>

   </body>
</html>
```

HTML File with 3 Visualizations with 3 Headings

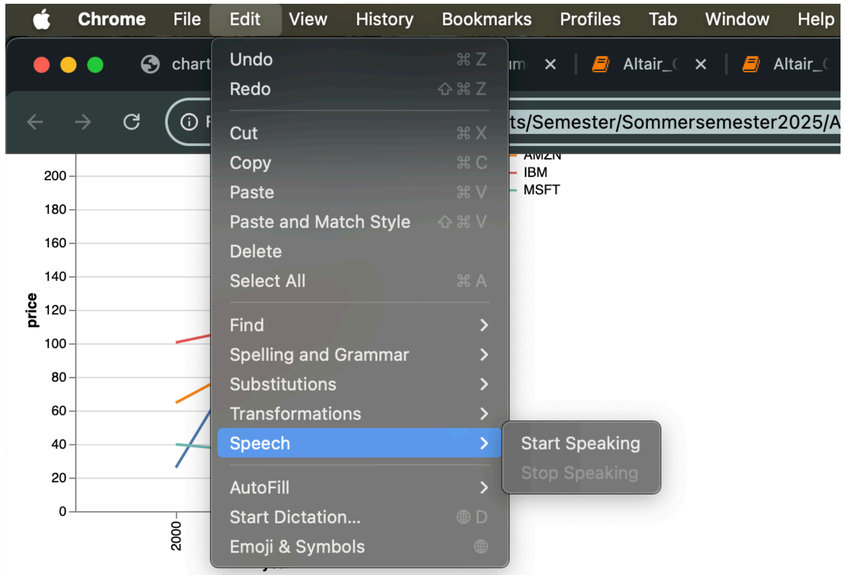
```
<!DOCTYPE html>
  <html>
   <head> … </head>
  <body>

  <h1>Visualization 1</h1>
    <div id="vis1"></div>
   <script> ALTAIR SCRIPT
      … const el = document.getElementById('vis1');
      vegaEmbed("#vis1", spec, embedOpt)
     …
   </script>

<h1>Visualization 2</h1>
    <div id="vis2"></div>
   <script> ALTAIR SCRIPT … </script>

<h1>Visualization 3</h1> …

   </body>
</html>
```

Describe the visualization for use with a screen reader

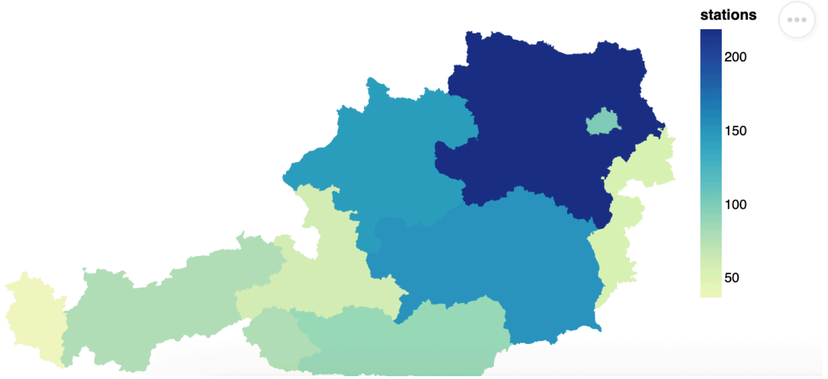
```
…
<body>

   <h1>Visualization 2</h1>

   <div id="vis2"></div>
     <!-- Screen reader description -->
   <div role="img" aria-labelledby="chart-title chart-desc">
      <h2 id="chart-title" style="position:absolute; left:-9999px;">
         Comparison of 4 stocks between 2000 and 2010</h2>
      <p id="chart-desc" style="position:absolute; left:-9999px;">
        The slope chart shows the stocks Apple, Amazon, IBM and Microsoft and their changes
        from 2000 to 2010. While Apple recorded the strongest increase,
        Microsoft's stock went down. </p>
    </div>

  <script> ALTAIR SCRIPT … </script>

</body>
</html>
```

Task

- from the 3 pairs of charts, select the variant that is most suitable for the respective question (so in total 3 visualizations)
- add a different type of interaction for each chart type
- customize each chart and add a meaningful title
- export all 3 charts and combine them in one HTML document
- add a text description for the screen reader output - use at least the 2nd semantic level (see next lecture slides)
- test the output with a screen reader



Visualization 3



Describing a data visualization

Accessible Visualization via Natural Language Descriptions: A Four-Level Model of Semantic Content

Alan Lundgard and Arvind Satyanarayan

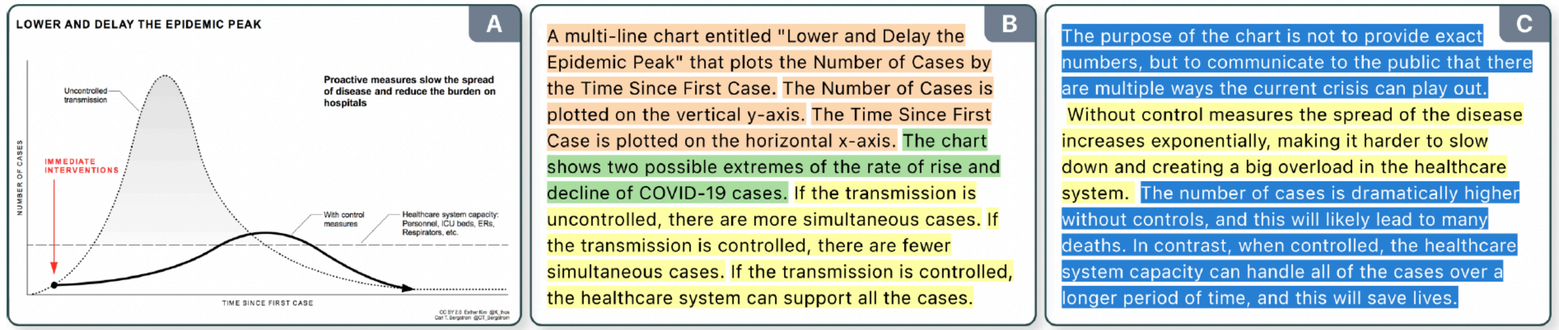


Fig. 1. Visualizations like "Flatten the Curve" (A) efficiently communicate critical public health information, while simultaneously excluding people with disabilities [11, 28]. To promote accessible visualization via natural language descriptions (B, C), we introduce a four-level model of semantic content. Our model categorizes and color codes sentences according to the semantic content they convey.

Abstract— Natural language descriptions sometimes accompany visualizations to better communicate and contextualize their insights, and to improve their accessibility for readers with disabilities. However, it is difficult to evaluate the usefulness of these descriptions, and how effectively they improve access to meaningful information, because we have little understanding of the semantic content they convey, and how different readers receive this content. In response, we introduce a conceptual model for the semantic content conveyed by natural language descriptions of visualizations. Developed through a grounded theory analysis of 2,147 sentences, our

https://vis.csail.mit.edu/pubs/vis-text-model

Describing a data visualization

Semantic Content:

descriptive statistics, extrema, outliers, correlations, point-wise comparisons

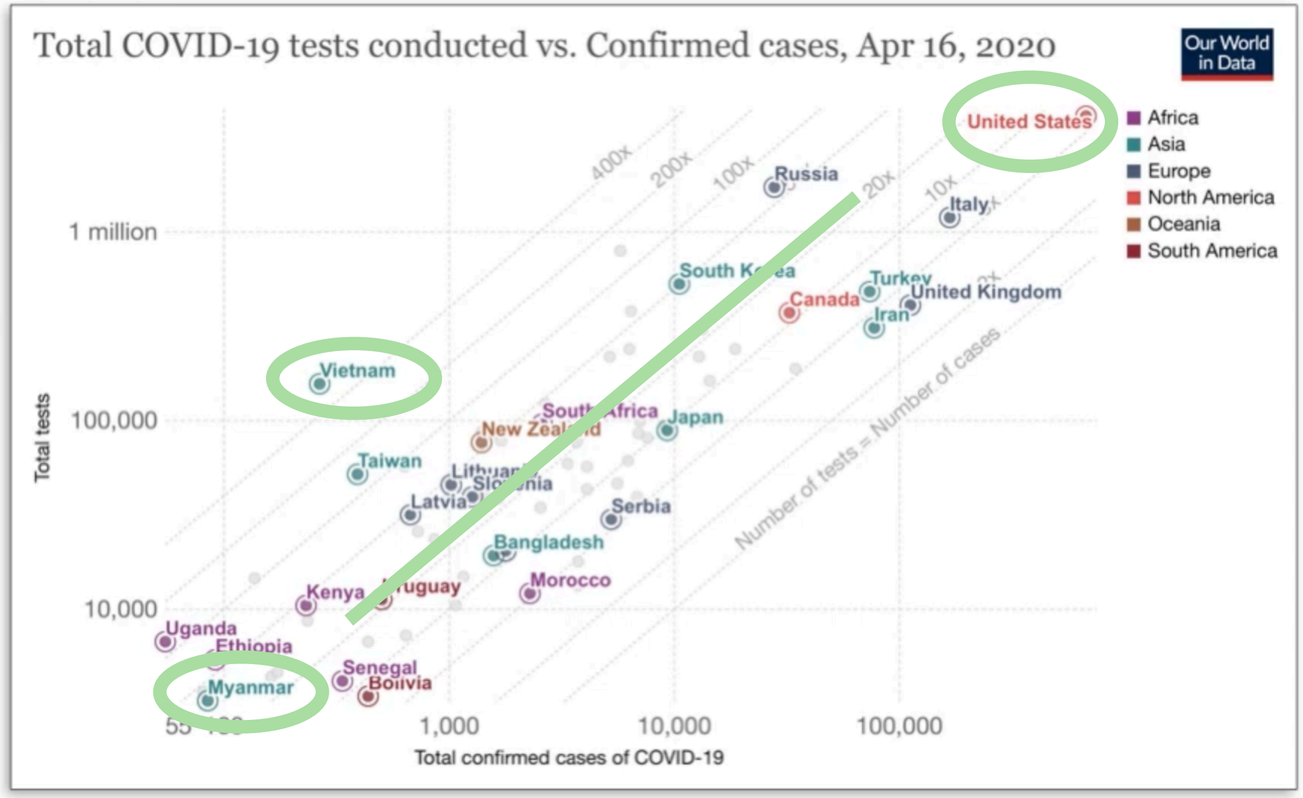
Example Sentences:

„The USA has the highest total tests at 4 million. Myanmar has the lowest total tests at 3.236.“

„Vietnam is an outlier with a low number of confirmed cases, but a moderately high number of total tests.“

„There is a positive trend between the number of tests conducted and the number of confirmed cases.“

Level 2: Statistical Concepts and Relations



https://vis.csail.mit.edu/pubs/vis-text-model