

University of Konstanz
Data Analysis and Visualization Group

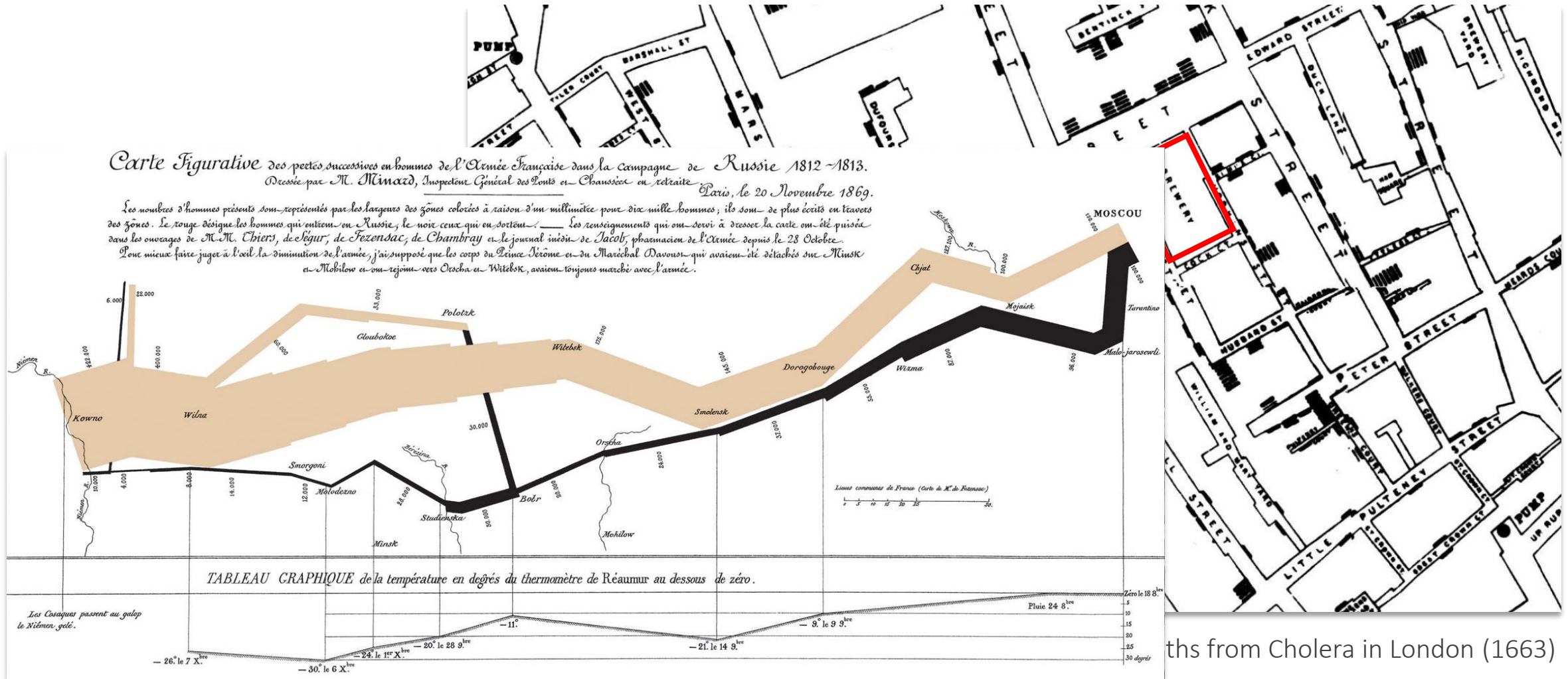


Summary

Raphael Buchmüller

Computational Linguistics Fall School 2024

Why is visualization useful?



Minard's Map (1869)

ths from Cholera in London (1663)

How to design visualization?



Domain situation

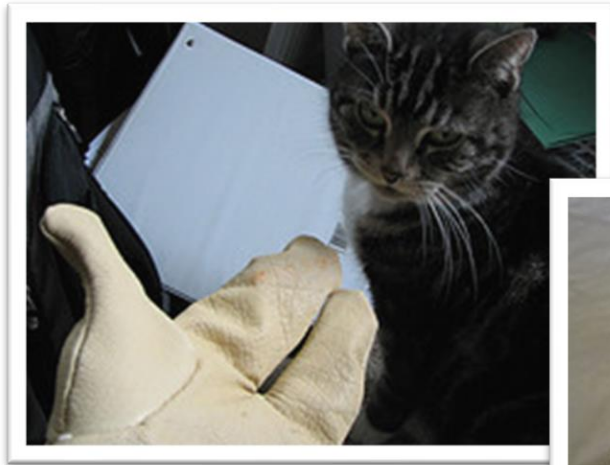
interaction idiom



Search

	Target known	     
Location known		     
Location unknown		     

Why is Computational Linguistics difficult?



Get the cat with the gloves.

Some Basics of Computational Linguistics

- Elements of Language
- Basic NLP
- Named Entity Recognition
- Similarity and Search
- Word Embeddings

Example sentences from Swahili, East Africa

1. ninasema.	I speak.
2. unasema.	You (<i>sg</i>) speak.
3. anasema.	He speaks.
4. wanasema.	They speak.
5. ninaona.	I see.
6. niliona.	I saw.
7. ninawaona.	I see you (<i>pl</i>).
8. nilikuona.	I saw you (<i>sg</i>).
9. ananiona.	He sees me.
10. utaniona.	You (<i>sg</i>) will see me.

How to create visualizations?



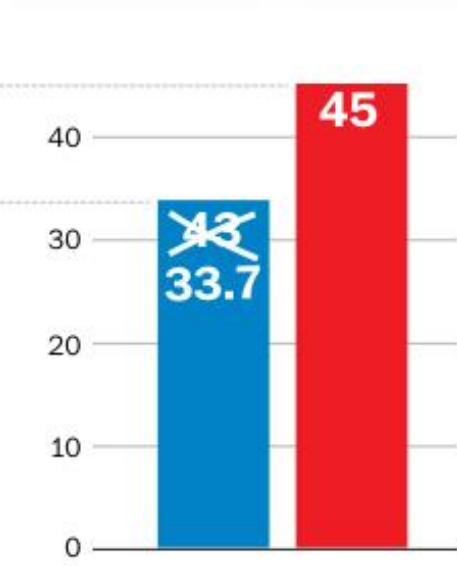
Be careful using color!

	Points	Lines	Area
position			
size			
value (shade)			
texture			
color			
orientation			
shape			

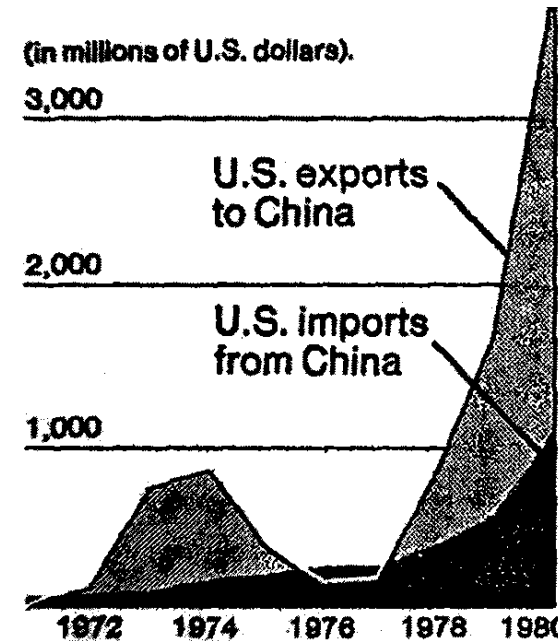
Combination of marks with positional and retinal variables.
Jacques Bertin, Sémiologie Graphique, 1967



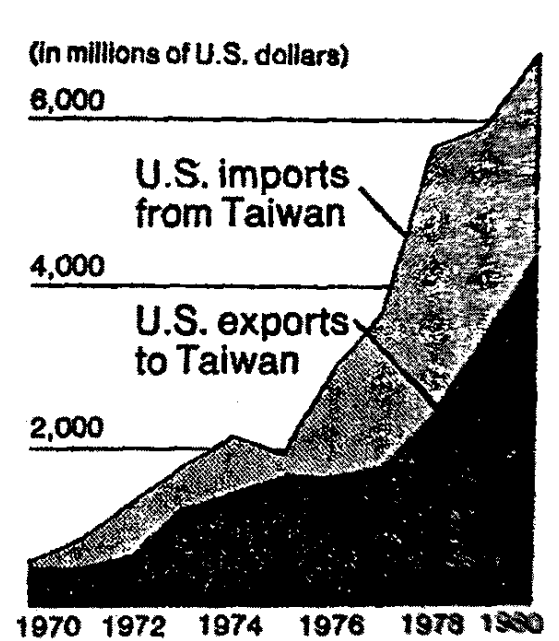
How not to create visualizations?



U.S. trade with China



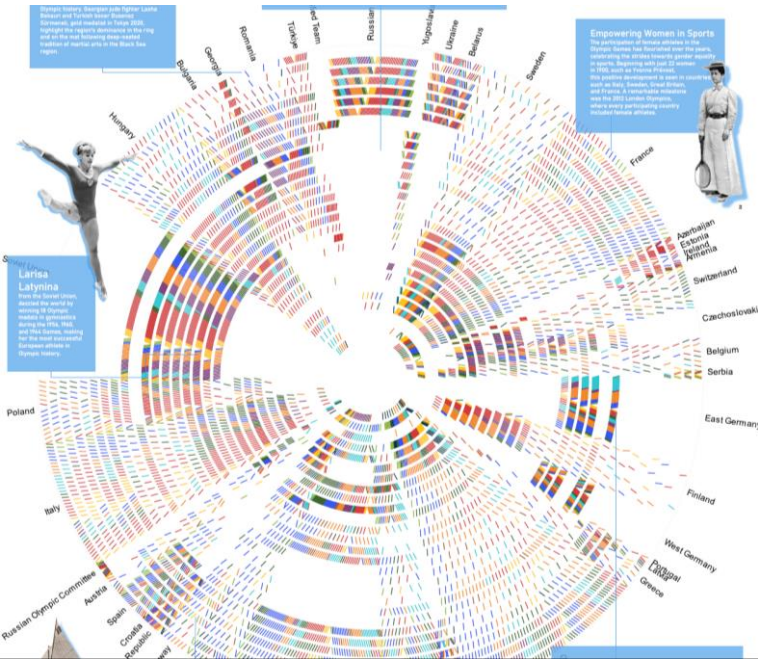
U.S. trade with Taiwan



Investigating U.S. trade: Comparison of exports and imports with China and Taiwan.

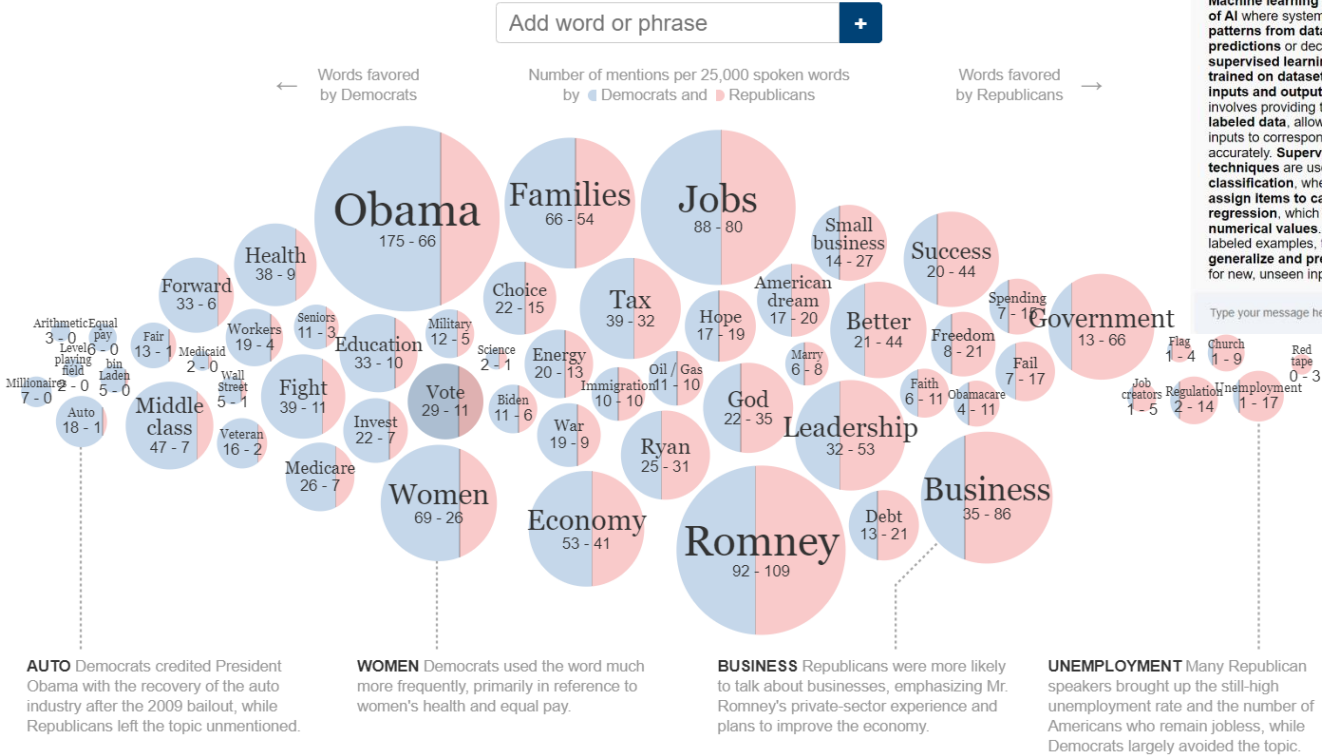
New York Times, Jun 14, 1981

Text Visualizations



Text Visualization Applications

A comparison of how often speakers at the two presidential nominating conventions used different words and phrases, based on an analysis of transcripts from the Federal News Service.



1 Explain the concept of **machine learning**, focusing on **supervised learning techniques**.

Machine learning is a **core area of AI** where systems **learn patterns from data** to make **predictions** or decisions. In **supervised learning**, models are **trained on datasets with known inputs and outputs**. The process involves providing the system with **labeled data**, allowing it to map inputs to corresponding outputs accurately. **Supervised learning techniques** are used for tasks like **classification**, where the goal is to **assign items to categories**, and **regression**, which **predicts numerical values**. With enough labeled examples, the system can **generalize and predict outputs** for new, unseen inputs.

Type your message here...

2 Generate a short story about the **fjords of Norway** and **its beauty** when **wandering** through.

The **fjords of Norway** shimmered in the **early morning light** as Ingrid **hiked along the narrow path**, **lowering cliffs**, dusted with **snow**, reflected on the **deep blue waters** below. **Sunlight filtered through the clouds**, **casting golden rays** on emerald green valleys. The air was crisp, filled with the sounds of nature—the gentle lap of water, distant bird calls, and rustling leaves. Pausing at an outcrop, Ingrid **marveled** at waterfalls **their silver streams glistening in the sun**, the way felt timeless, **their beauty pure**, leaving her with a deep **sense of peace** and **wonder**.

Type your message here...

3 Improve the following letter making it more formal and concise.

Dear Sir, I am writing this email to let you know that I really liked your cool idea. It was awesome, and I hope everything is going fine. Please get back to me ASAP.

Dear Sir, I am writing this email to let you know that I **really liked** appreciated appreciated your **cool idea** innovative concept. It was **awesome** remarkable, and **I hope everything is going fine** I trust this message finds you well. Please **get back to me ASAP** respond at your earliest convenience respond at your earliest convenience.

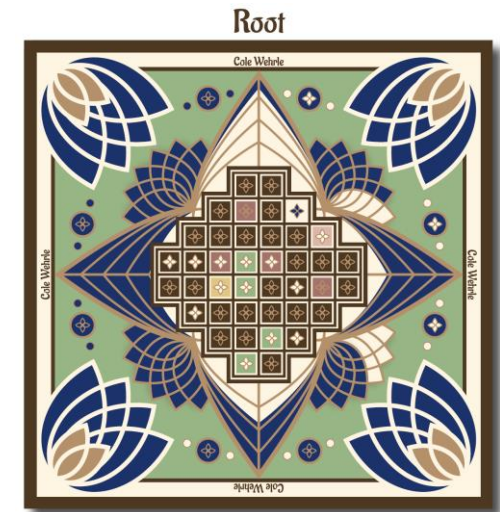
Type your message here...

4 Summarize key strategies in adapting agriculture to climate change.

Adapting agriculture to climate change requires a **multi-dimensional approach**. Key strategies include **drought-resistant crops**, **sustainable farming techniques**, and **efficient irrigation systems**. **Incentives like subsidies and policies for water and soil management** are essential.

Climate change adaptation in agriculture involves using **drought-resistant crops**, **sustainable farming practices**, and **efficient irrigation**. Policy measures, like **subsidies and resource management**, support this transition.

Type your message here...



Text Visualization in a Nutshell

