# Visualization
## – Introduction (Questions)

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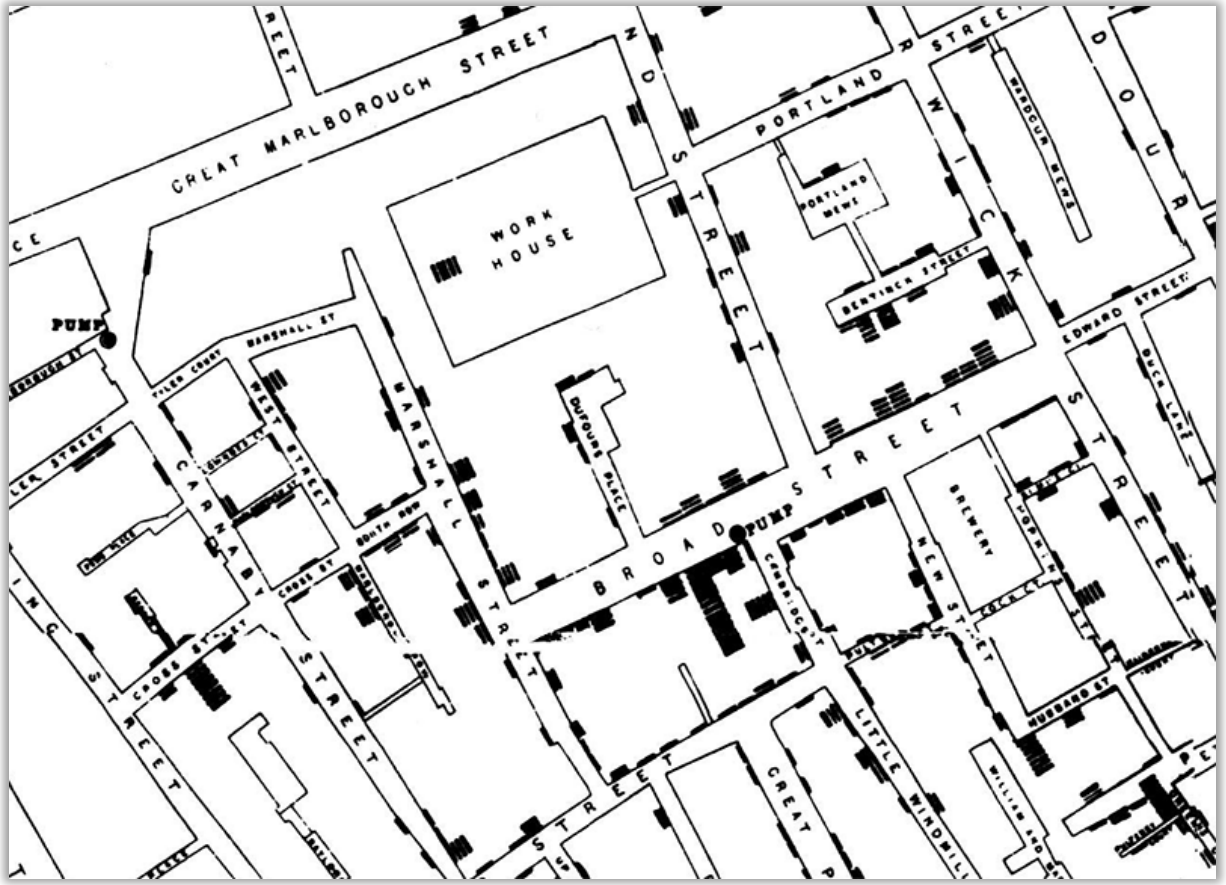
# Possible Questions

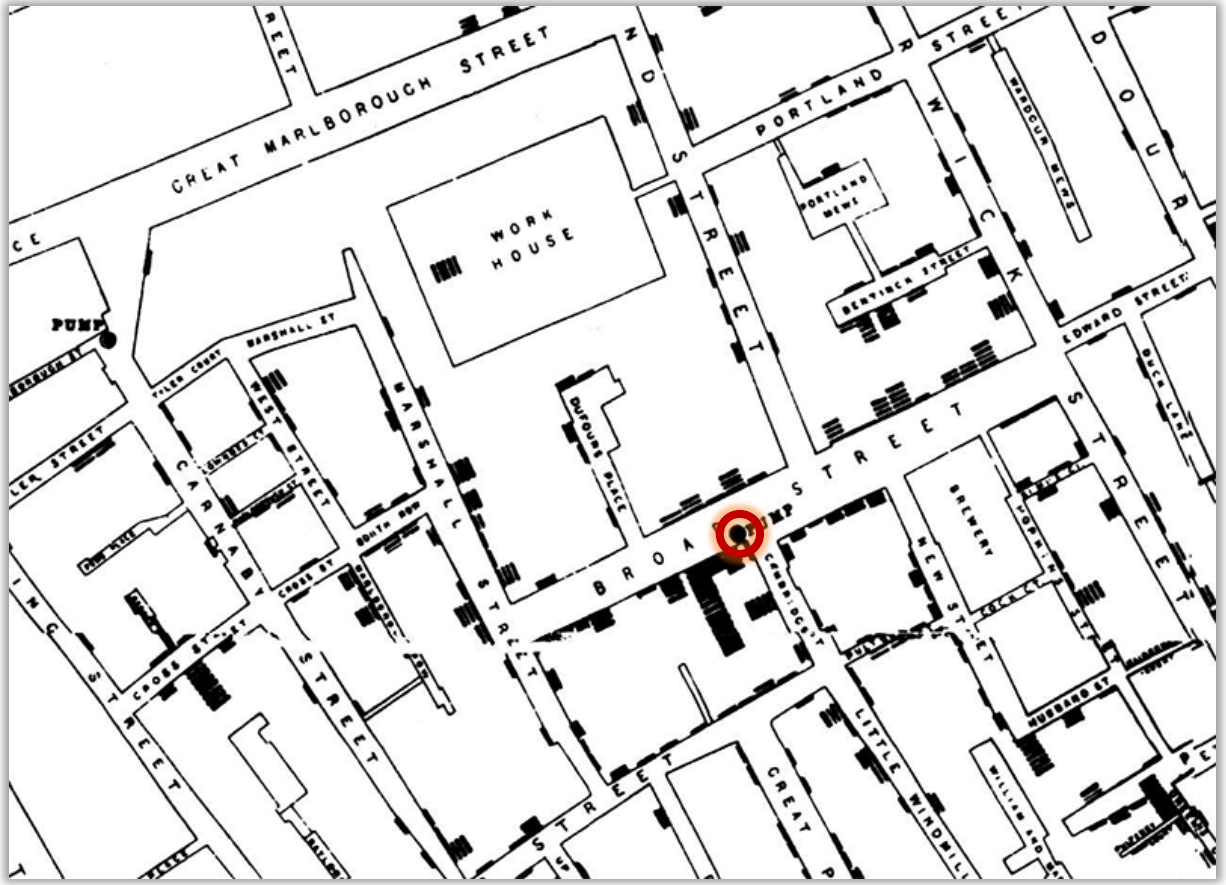
What does this map show us?



# Possible Questions

What does this map show us?

- Map of the cholera outbreak
- Black boxes represents deaths
- Conclusion: the pump may be the source for the deaths



# Possible Questions

- Why is visualization useful?

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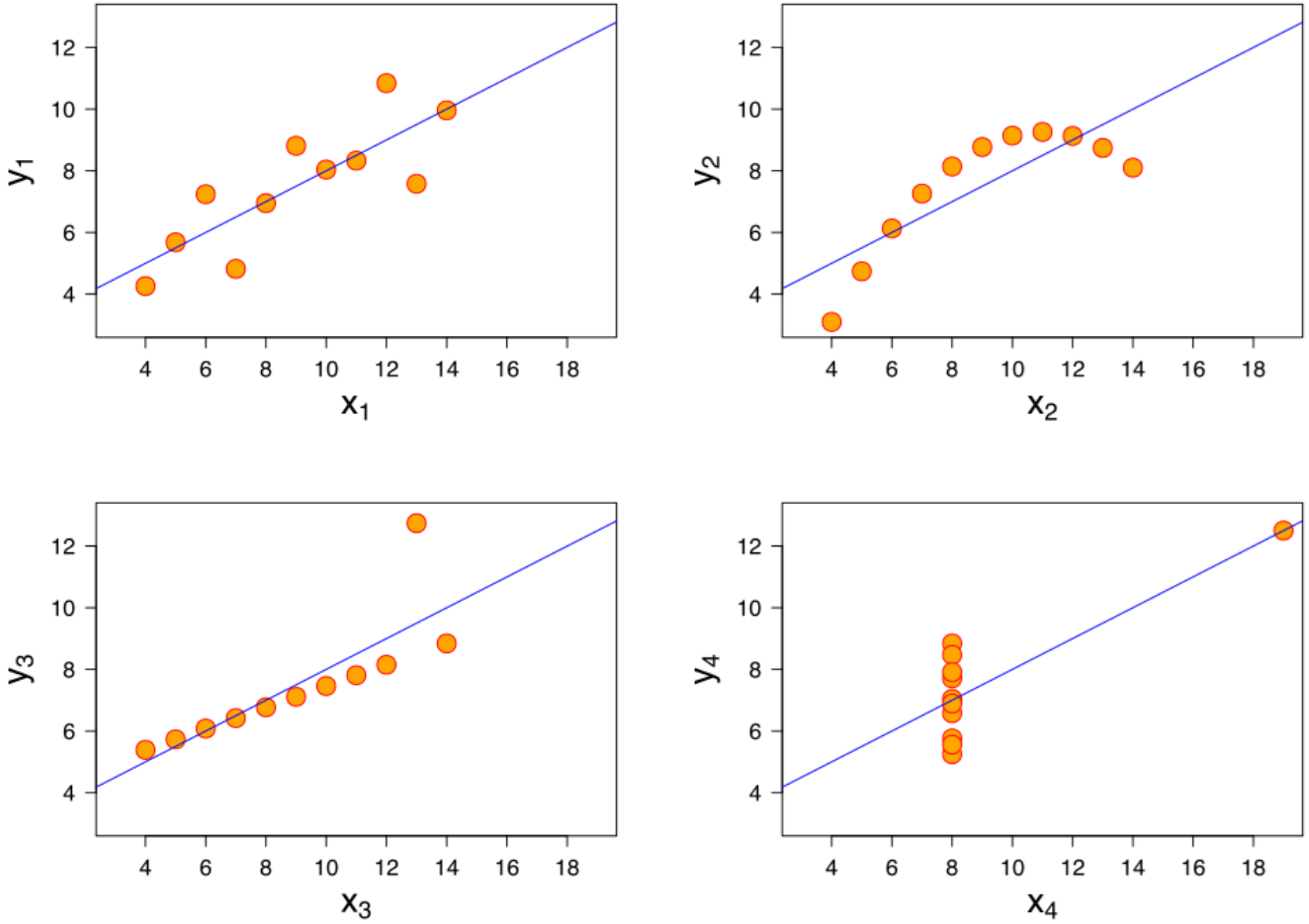
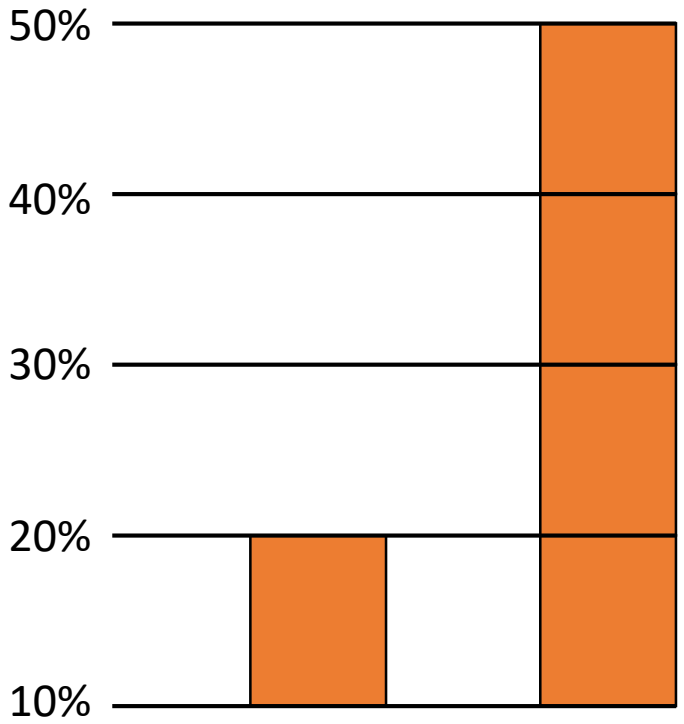
- Statistical measures may be not enough for an understanding of data, e.g., data points may have the same statistical measures, but differ



# Possible Questions

- Determine Tufte‘s Lie Factor



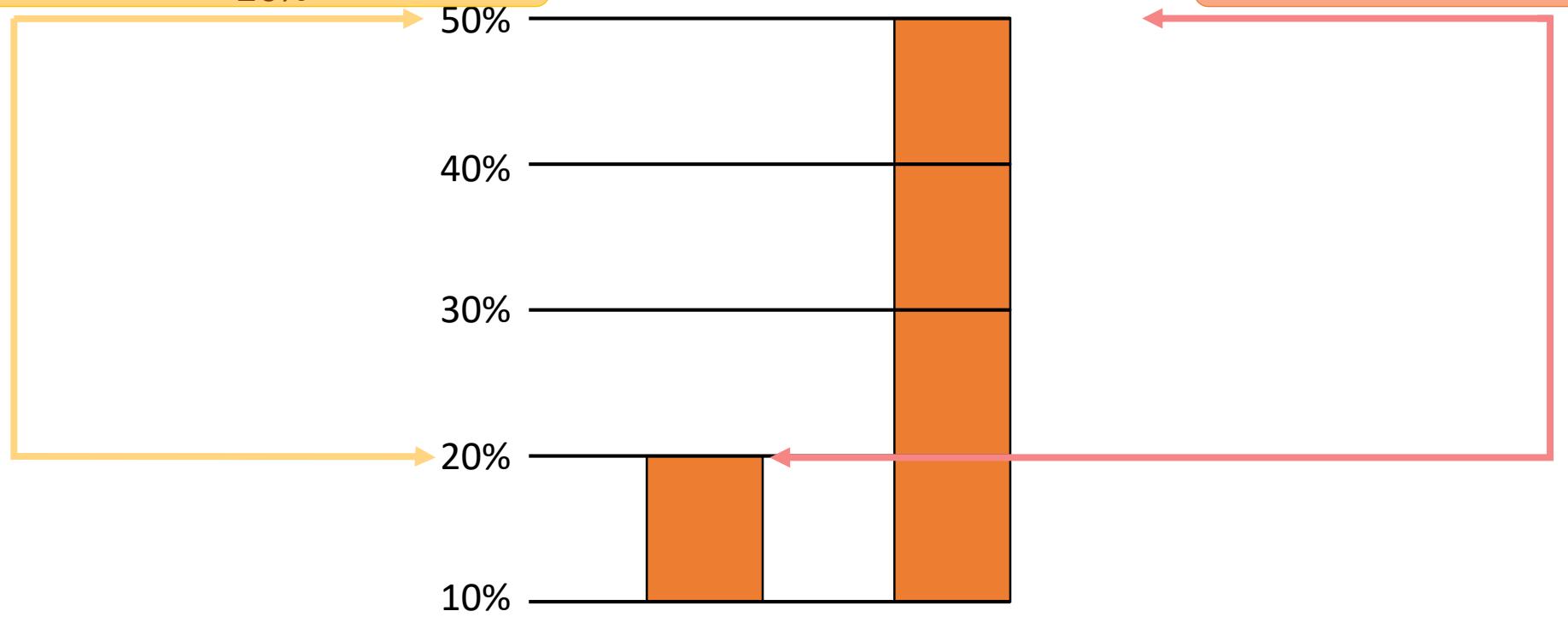
# Possible Questions

$$\text{Lie factor} = \frac{\text{Size of effect shown in graphic}}{\text{Size of effect in data}}$$

$$\text{Size of effect} = \frac{|\text{2nd value} - \text{1st value}|}{\text{1st value}}$$

$$\text{Size of effect} = \frac{|50\% - 20\%|}{20\%} = 1.5$$

$$\text{Size of effect} = \frac{|4 - 1|}{1} = 3$$



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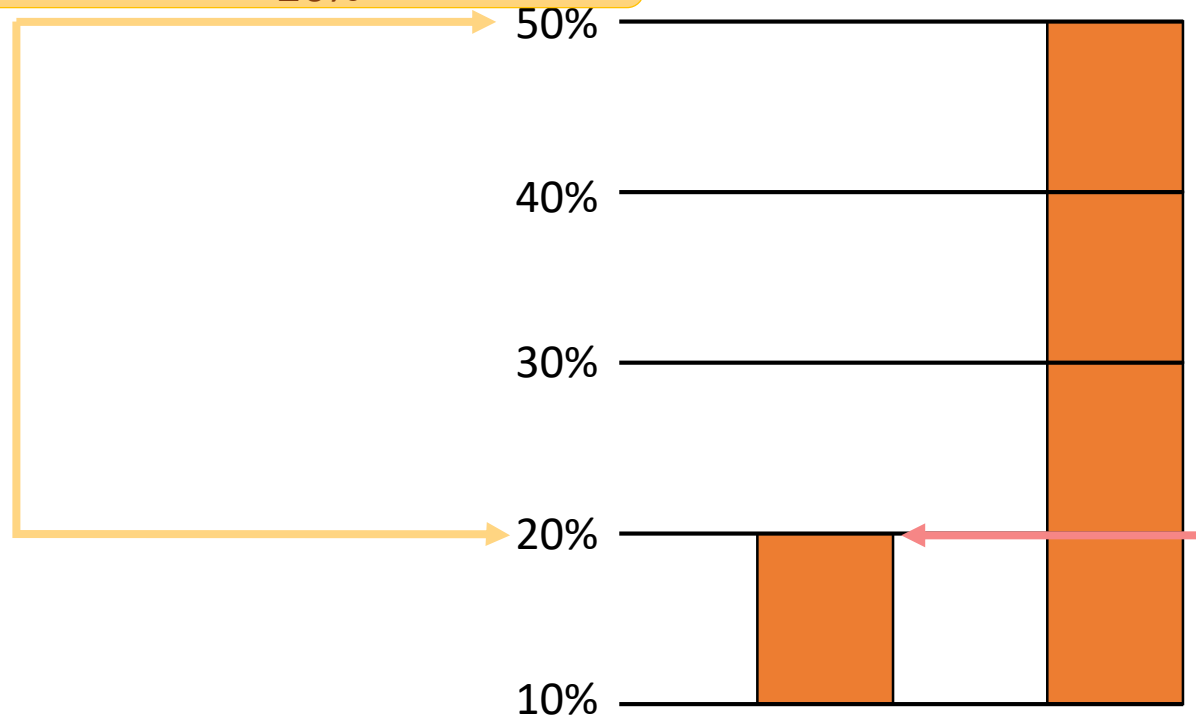


$$\text{Size of effect} = \frac{|4 - 1|}{1} = 3$$

$$\text{Lie factor} = \frac{3}{1.5} = 2$$

# Possible Questions

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- Perceptual phenomenon
- Change in a visual stimulus that is not noticed by the observer
- E.g.: Observe a scene, you get distracted, the scene change, you do not notice the difference

# Possible Questions

- State two goals of visualization

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Visualization is good for

- **Visual exploration**
  - find unknown/unexpected
  - generate new hypotheses
- **Visual analysis** (confirmative vis.)
  - confirm or reject hypotheses
  - information drill-down
- **Presentation**
  - effective/efficient communication of results

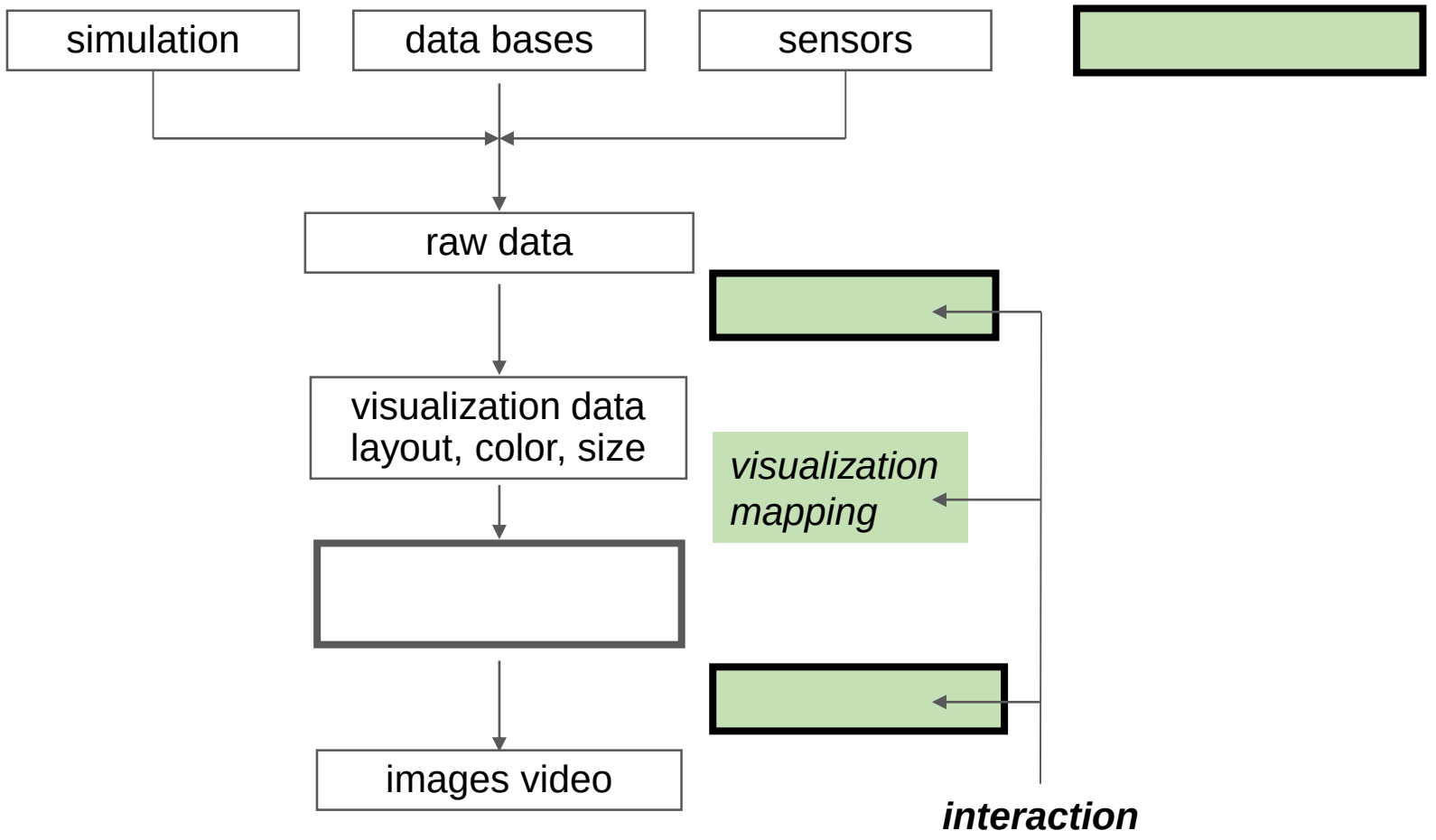
Nothing is known about the data

There are hypotheses

“Everything” is known

# Possible Questions

- Complete the pipeline



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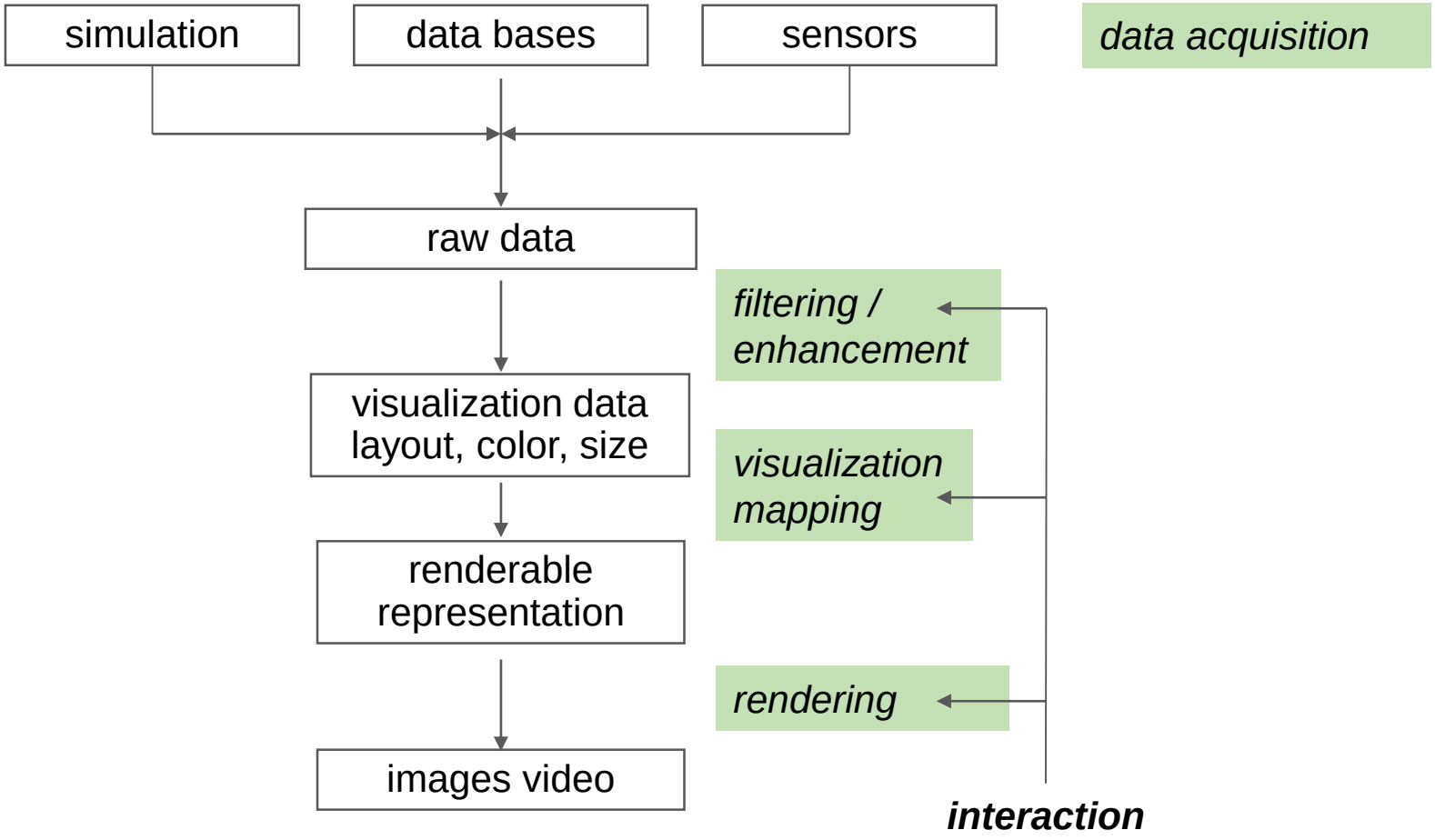

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| Data generation/acquisition | Visualization (rest of vis. pipeline) | Interaction (user input) |
| --- | --- | --- |
| • Measuring, simulation, modeling<br>• Can take very long (measuring, simulation)<br>• Can be very expensive (simulation, modeling) | • Data filtering/enhancement, vis.mapping, rendering<br>• Depends on computer/implementation: fast or slow | • How can users change parameters, viewpoint, etc. |