

How to design effective animated data visualizations

Visual tasks

required to understand the visualization

Track Objects or Features

Track object set:
Where did the marked objects go?

Track object identities:
Where did each country go?

Make Holistic Judgments

Judge average motion of all objects:
Did distribution shift?

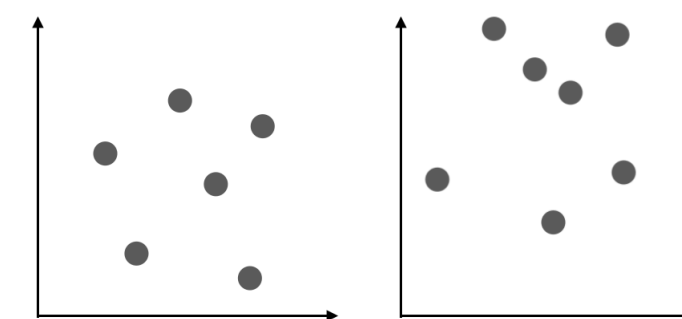
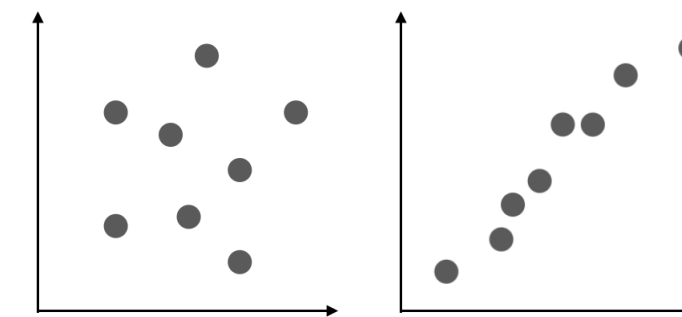
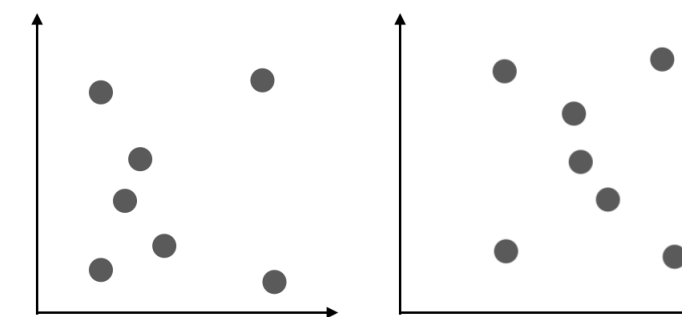
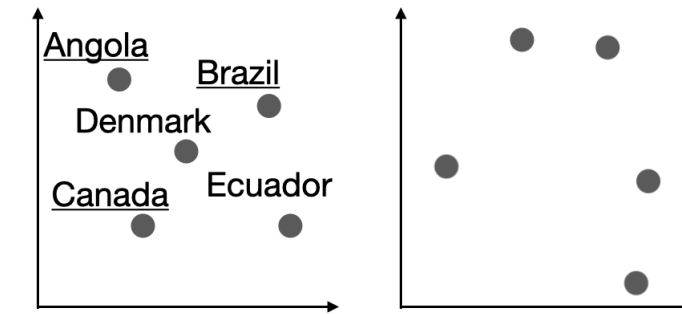
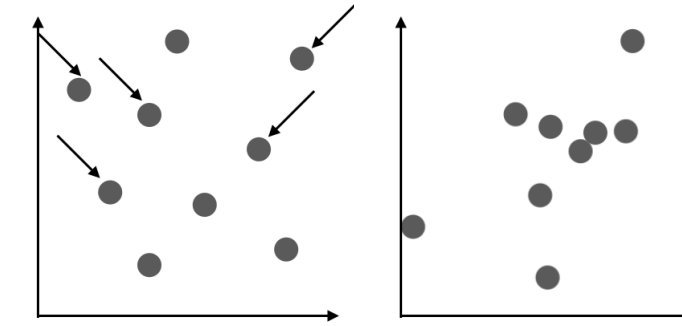
Judge changes to holistic
shape envelope:
Did correlation change?

Notice Objects Added or Removed

Which object appeared
or disappeared?

For example

Earlier frame Later frame



Visual capacity

Possible to follow 3-4
of the targets,
but more is difficult

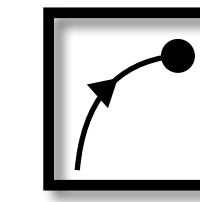
Fails for more than
1-2 identities

Powerful for
seeing average
motion patterns

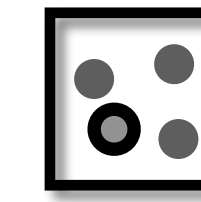
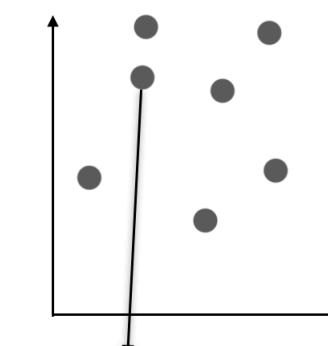
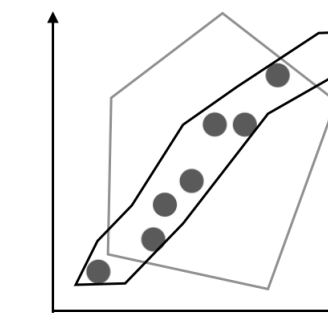
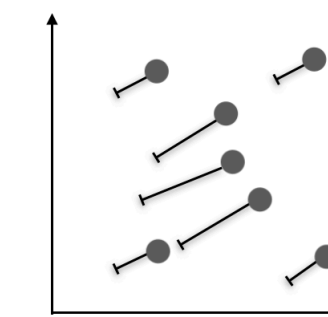
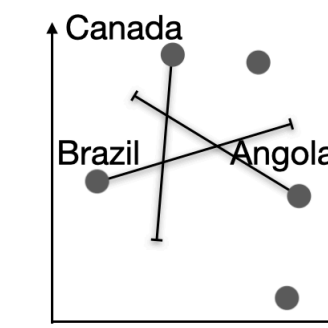
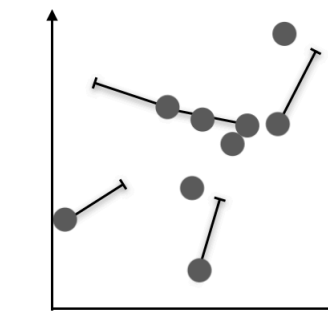
Can be powerful
but limits are yet
unknown

Unlikely to spot new
object in busy display

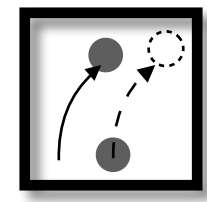
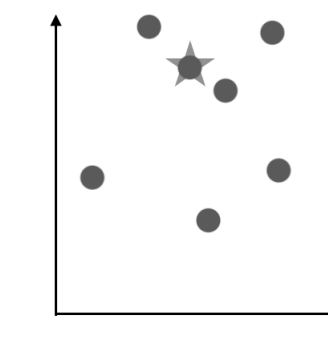
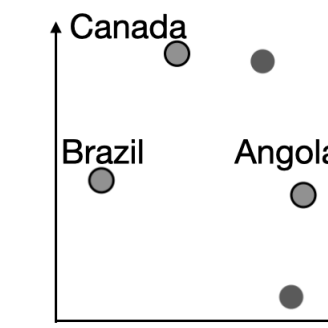
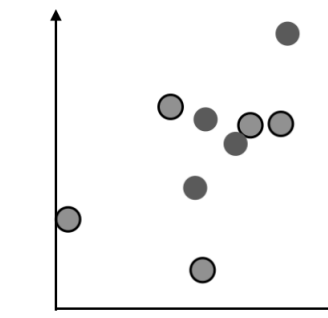
Techniques to make the task easier



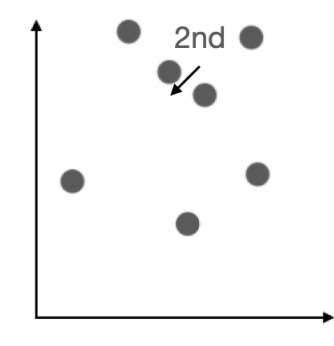
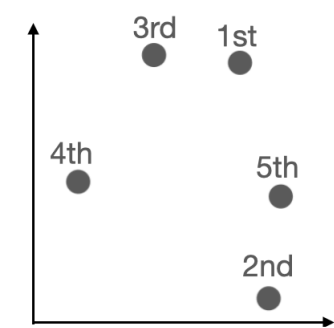
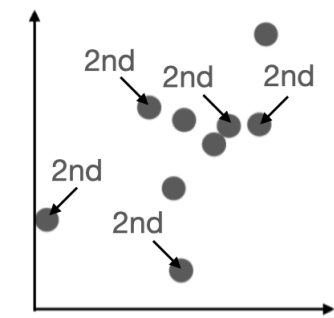
Showing
history
traces



Highlighting
relevant
objects



Moving
objects in
stages



Interactive controls are helpful too: allow viewers to pause, replay, or slow down animations, or allow additions of these helpers below (e.g. a button to add traces).