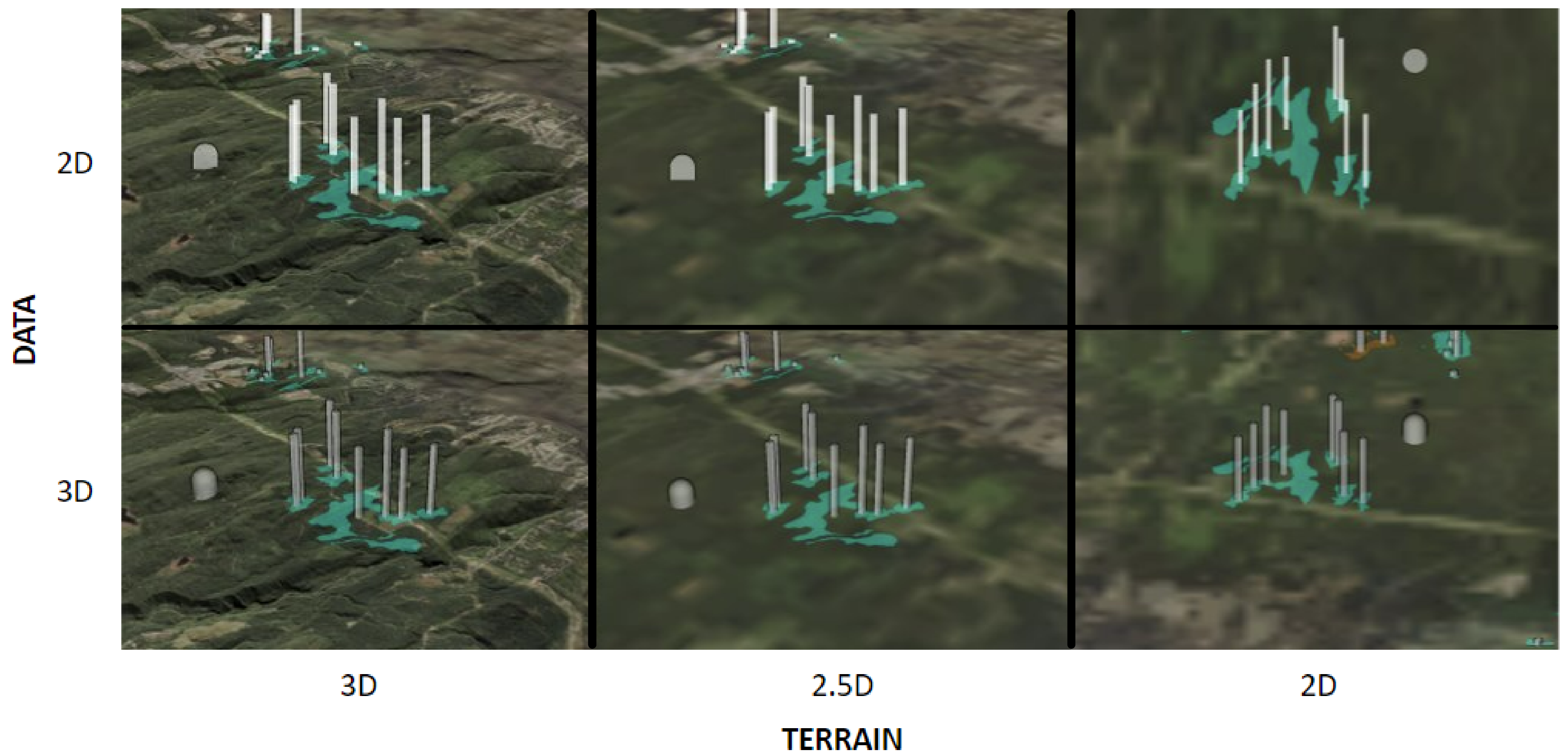# Data Perception on Maps based on 2D and 3D presentation of Data and Terrain

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RESEARCH GOAL I:
To understand how people perceive data in different views.

SYSTEM - SINGLE MODE:
- Consists of 6 views based on dimensionality of Data and/or Terrain.
- Each view is shown separately and is static.

METHOD:
- A within-subject quantitative study.
- Participants perform low-level tasks in different conditions (displays) with different number of distractors.
- Measures are completion time and error

TASKS:
- Find the tallest bar
- Find the smallest distance between two bars in the X-Y plane.

HYPOTHESES:
- Performance is similar across conditions to compare height for any number of distractors.
- Performance is similar across conditions to compare distance with a small number of distractors but decreases with 2.5D terrain when the number of distractors increases, and even more so with 3D terrain.

RESEARCH GOAL 2:
To unveil strategies adopted by people to perform tasks.

SYSTEM - MOSAIC MODE:
- Consists of 6 views based on dimensionality of Data and/or Terrain.
- All the views are displayed together and are dynamic.

METHOD:
- A within-subject qualitative study.
- Analysis of participant's eye-movement and interactions while performing higher-level real-world tasks from the field of Visual Impact Assessment.
- Data collected using eye-tracker and interaction logs.

TASKS:
- Select N bars that are on the highest terrain elevation.
- Select a Viewpoint from which the maximum number of polygons/bars are visible.

HYPOTHESES:
- 3D terrain and/or data are useful for navigation and searching objects because they leverage spatial memory.
- 2D terrain and/or data is useful for precise comparison and navigation due to less occlusion and depth distortion.
- 3D display is preferred for some high-level tasks even if it comes with a decrease in performance.