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--- PERCEPTION AND ATTENTION ---
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How the perception differes from left and right eye ?

The truth about relativity: Predictable irrational

Does not communicate for doors unless written.

We learn a lot from ourinteractions. Those results help us to design actual stuff.
The results of our visual representations replace cognitive calculations. But each decision is related to user's individual memory. But what we can augment is time people need to comprehend. But we cant control the background the user is in.

Split second of time saving. Human Factor.

Think about binary matrix (1-link present, 0-no link) we can represent it as a network. We have a corresponding datatype. Time series, space (planes in x and y), relational network because of the complexity. To not confuse our eyes, we need different types of curves to distinguish between different relations.

Lines: why parallel lines is not a good representation. Here we have only 6 categories of a time series. Tall data is better than wide data. Continuous over time. Somehow still differentiate between different line but it is difficult when they collide. Similar to parallel lines.

Interactive search and filtering is often used to compensate for this problem.
Filters are preset variables.
Search is another interaction.
More easy to understand complex line chart.

What if it is not possible to do interactions? WE can use stacked graphs. But this has a disadvantage, we can noly see proportional difference but if they are similar it is hard to distinguish. It is good enough for seeing trends but not for comparison.

Small multiples. Same x and y charts. Tries to leverage our learning time. Easy to compare between different categories. See the true resolutions of each category.

Small comparisions. Envisioning information. Similarity nd proximation. Visually ennforcing our eyes to do the comparision and find the differences.

Stroop effect. Encourage our eyes to compare. But when we do comparisions we often get off balanced by colors. different color for different color names confuses the eyes and the mind's breakdown of understanding. Because the delay is needed to communicate what you see and what you read and then make an informed decision.

Adopting accuracy as a criterion is a conceptual trap.

Seeing, perceiving, knowing. We have limitations with memory and comprehension without having a lot of time.
Limitations based upon working memory capacity.
Make users focus on only the necessary pattern.

Elementary perception tasks.
Compare different charts. Harder to differentiate without alignment, scales etc. Here bar chart is better than pie chart.
Also if there is no alignment, no relativity it is harder to compare.

Perception accuracy: High to Low
                Position along a common scale - alignment makes it better.
                Position along nonaligned scales -
                Length, direction, angle - elements we need to apply.
                Area -
                Volume, curvature -
                Shading, color saturation -

Recognize by remembering: mind corrects some discrepencies we see in the background because thats how we remember it when we see it somewhere else.

Graphical form involves a lot in our preceptual tasks.

Increase engagement. Hand drawing increases the engagement in charts. But in bar charts it reduces the effect because it shows inconsistencies. So need to know where your choice has a better effect.

What makes viz memorable?

-- MAPS --

Normalizations: How do we deal with it to present and interpret data in an area (maps)?

Maps give us oerview of general area and an overview of general idea. Zoom and filter help us to see different levels of information.

Once you are oriented around the landmarks we can look into the details then?

Making a mental map of the direction you are travelling and comparing it to real world?

Orientation ability: how our brains rotate when we look at the map? how we tell ourselfs to follow the direction? There is a compass on the maps to tell us the direction we are moving towards: north, south etc.
Varies from individual to individual. Affects the way how we find way. Our perception makes the difference of how we perceive it.

Spatial Ability: mentally manipulate 2D and 3D objects.
Its the capacity to unerstand and remember the spatial relations among objects.

Visual Image vs Verbal Image:
How the readers interpret? This is how. THey use these two things.
Look at the visual information, you remember the glimps of the shape and their orientation.
We try to remember the visual info as a sequence of objects but we dont connect it the type of objects and the properties of objects.

Effects of Spatial Ability:

Our attention/focus need to be summariezed.

Multidimensional information could fill in the gap between individual difference and various needs and contexts.
How do we have one that fits all?
We can implement something like this when making spatial vizualisations.
THere is very small room of error.

Multidimensional viz is not always the best solution.
Why not give them a 3D view for more information. But it turns out the cost of reaction time makes it ambiguous to infer.

3D bar chart is not easy to understand. Still you need 2D bar chart for precise comparisons.

how do we remember the locations and the spaces around us?
- Landmark knowledge: salient and recognizable objects
- Route knowledge: consist of sequences of landmarks
- Survey knowledge: built by personal experience through exploration, represent distance and relationships among landmarks

It can also be a combination of these for better understanding. These cognitive maps attach the sentiments to it based on an individual's background.

Combination of linear and spatial way gives the user personalization feel.

Today, we get and estimated generalized and interpretation of true geographic conditions.
The map is trying to make it more universal and also comprehensible of all information.

Universal language of thoughts and how we perceive so we can make an aproximation without actually knowing the language.

How to reconstruct the map. Connect all info we have.
Information retieval. Ranking, mapping etc.

aka: Information systems. eg: Dewey decimal system

Map can be built into multi-views.
It also matters individually and is different for all.
How do we create a map which everyone can understand. Make it more catered for the users.

Entity workspace: combination of all entities and their connections. Each piece of evidence can be extracted and connected. The metadata can establish links between all the evidence.

Geographic Profiling: The condensed heat map density view will show those evidence freq based upon how those events happened.

we dont read maps when they are very comples. we need interactions to find precise info.
Presenting info
Exploring info: to leave the users the path to explore new stuff.

Mashup: see maps and text data side by side.
eg: Craiglist: gives aggregate information .Heat map, density map.