

Presentation #1

Title: A Simple Pipeline for Coherent Grid Maps

URL: https://virtual.ieeevis.org/session_f-papers-geospatial.html

What I learn from the presentation alone?

From the presentation, I learned about the elements that make a good grid map. These elements include distance, displacement, adjacency, contiguity, direction, and global shape. Also, the contrast between a good grid map and a poor grid map. Moreover, the difference between simple maps and complex maps. For a simple map, it only has one color. A simple map uses point-set matching, which assigns regions to tiles to minimize displacement. As for complex maps, there is a larger variation between different areas.

Moreover, I learned about the technique designed by McNeill and Hale. When sometimes using the technique from McNeill and Hale doesn't correctly represent the shape of the original input map, when using a simple pipeline can greatly visualize the input map. Finally, the presentation introduces the steps of the simple pipeline, including decompose into parts, represent part with tiles, and optimize displacement.

Comment on presentation

The presentation is overall very clear and comprehensive. I learned a lot about this simple pipeline technique just from the presentation itself. This presentation includes a lot of information that introduces this new technique. Moreover, it also made a comparison between one of the old techniques and the new one, which greatly shows the advantage of this new technique.

Ask a question:

How does this simple pipeline technique perform when the input map is sporadic?

Presentation #2

Title: Topology Density Map for Urban Data Visualization and Analysis

URL: https://virtual.ieeevis.org/session_f-papers-urban-space.html

What do I learn from the presentation alone?

From the presentation, I learned that topological means locations in urban areas are connected through roads and intersections. Moreover, the proximity of two points could be very different, unlike Euclidean distance. Thus, a topology density map needs to have requirements: correctness, intuitiveness, and accessibility. I also learned about how to calculate the density estimate on the road network and the algorithm that allows us to find the shortest path. Eventually, we will be able to compute the density field on each vertex and draw the density along the edge. Besides, I learned about the influence of road topology and traffic conditions on

accessibility and how it relates to finding the optimal location of a new public service facility. Moreover, the limitation of this new technique.

Ask a question:

What are the ways that can potentially minimize the limitation of this technique?

Presentation #3

Title: A Visualization Interface to Improve the Transparency of Collected Personal Data on the Internet

URL: https://virtual.ieeevis.org/paper_a-vizsec-1011.html

What do I learn from the presentation alone?

I learned three related work with this paper, including PrivacyInsights, DataTrack, and Visits. These are all useful tools to use in the future. Moreover, how to classify the common internet user into an unconcerned, pragmatist, and fundamentalist by their attitude to data. Besides, three different support for uses includes support perception, support comprehension, and support projection. Moreover, I learned the definition of file element and data elements which are two types of data.

Ask question:

Is there a possible way that allows the user to learn what can be generated from their data?

Paper #1:

List the complete title of the paper, the authors, and their affiliations. Most of the paper PDFs you can find online. List the URLs of the papers.

A Simple Pipeline for Coherent Grid Maps

By Wouter Meulemans, Max Sondag, and Bettina Speckmann

https://ieeevis.b-cdn.net/vis_2020/pdfs/f-info-1166.pdf

Summarize the paper:

- a. Why do you choose this paper?

The reason that I chose this paper is, I have always wondered how the grid maps are generated. For me, these grid maps look very similar to the original map, but they are still different in some ways. Thus, I would like to know more about the techniques behind the grid map. Moreover, because the title of this paper is “A Simple Pipeline for Coherent Grid Maps”, I am curious about how simple the technique is.

- b. What is the **problem** that the paper tackles? What **research questions** does the paper ask?

This paper tackles that State-of-the-art techniques can only deal with simple cases and the new technique introduced is able to compute coherent grid maps.

The research question that this paper asked is what are the ways to capture the various facets of coherence and algorithms to compute the actual grid maps and how to optimize for computing grid maps.

- c. What is(are) the **technique(s)** that the paper proposes to solve the problem?

This paper introduced a new algorithm for complex cases which is a 3-step pipeline for coherent grid maps. It also decomposes the shape based on salient features. It uses the medial axis to identify candidate cuts, this guarantees that all cuts are pairwise disjoint. Moreover, it arranges tiles using mosaic cartograms. They used the decomposition result to compute a tile arrangement. By using Mosaic Cartograms, they can deform in a shape-aware manner while maintains the contiguity and global adjacencies between the part as optimizing for global directions between neighboring parts. This paper also introduced the technique to assign elements to tiles via point-set matching. They compute the affine transformation so that the bounding box of the set of tiles is equal to the centroids of the spatial elements.

- d. If the paper includes a visualization system, summarize the system by the ***What, Why, and How*** questions that we often use in class.

System	LineUp
What: Data	Geospatial
What: Derived	Ordered attribute: the weighted combination of selected attributes in different geographical location
How: Encode	Heat map, mosaic cartograms, bounding box, grid maps
How: Manipulate	Decomposition, make candidate cuts, arrange tiles, assign elements, transformation
Why: Task	Distributions, allocation

- e. What is the main **contribution** of the paper? That is, what has been done by the authors that were not possible before?

The main contribution of the paper is to generate more accurate coherent grid maps with a simple technique than before. The grid maps generated by old techniques are not accurate enough, and this new technique greatly improved on this.

Paper #2:

List the complete title of the paper, the authors, and their affiliations. Most of the paper PDFs you can find online. List the URLs of the papers.

Topology Density Map for Urban Data Visualization and Analysis

Ze Zheng Feng, Haotian Li, Wei Zeng, Shuang-Hua Yang, and Huamin Qu

https://ieevis.b-cdn.net/vis_2020/pdfs/f-vast-1274.pdf

Summarize the paper:

a. Why do you choose this paper?

The reason that chose this paper is I have been always curious about does map applications such as Google Maps find the optimized route. I'm also interested in the topology density map's generation algorithm because this is a widely used map in Data Visualization.

b. What is the **problem** that the paper tackles? What **research questions** does the paper ask?

This paper overcomes the limitation of the conventional methods which are mainly based on Euclidean distance and therefore failed to use in the urban analysis that shall consider road network and urban traffic. This new method allows people to provide more accurate information to users and provides an intuitive visualization for decision making.

c. what is(are) the **technique(s)** that the paper proposes to solve the problem?

This paper used an effective visualization technique called a density map. Density maps depict the continuous distribution of the scalar field in a 2D planar space by assigning a unique color to each individual scalar value. Moreover, this paper proposed a new technique called topology density map which fulfills the requirements for a new method that can derive scalar fields outside the road network. This paper also used NKDE which is able to estimate the density fields of road-constrained events on a road network, such as the impacts of traffic accidents.

d. If the paper includes a visualization system, summarize the system by the **What, Why, and How** questions that we often use in class.

System	LineUp
What: Data	Table, map
What: Derived	Ordered attribute: a weighted combination of selected attributes.
How: Encode	Density maps, topology density map
How: Manipulate	Reorder, use NKDE, assign a color
Why: Task	Find optimized route, find an optimized location

e. What is the main **contribution** of the paper? That is, what has been done by the authors that were not possible before?

This paper successfully made an effective tool for urban analysis. This Topology Density Map surpasses the performance of conventional planar KDE and NKDE in satisfying two specific

requirements. Before the invention of this method, there are limitations that the conventional methods are mainly based on Euclidean distance, which did not consider road network and urban traffic. This new invention, however, overcame these problems.

Paper #3:

List the complete title of the paper, the authors, and their affiliations. Most of the paper PDFs you can find online. List the URLs of the papers.

A Visualization Interface to Improve the Transparency of Collected Personal Data on the Internet

Marija Schufrin, Steven Lamarr Reynolds, Arjan Kuijper and Jorn Kohlhammer, " Member, IEEE

https://ieevis.b-cdn.net/vis_2020/pdfs/a-vizsec-1011.pdf

Summarize the paper:

a. Why do you choose this paper?

I chose this paper because the content is closely related to my life. I have recently received many spam emails and spam calls because my data on Chowbus (An food delivery App) has been leaked. Thus, I would like to learn more about the transparency of personal data on the Internet, also the ways that can help to improve it.

b. What is the **problem** that the paper tackles? What **research questions** does the paper ask?

Users used to be powerless in many situations of misuses and data leakages, thus they have been developed an attitude of neglect of their online behavior. Even that GDPR allows user to download their personal data, but the data received are hard to understand or analyze. So this paper tackles the problem above by designing a web-based interfaced called TransparencyVis which allows users to explore their personal data, and have better online behavior.

c. What is(are) the **technique(s)** that the paper proposes to solve the problem?

This paper used visualization of data flows which shows who the data is shared with, and the details of the provided information. It also used inferred data by showing the statistical information to show what is possible to infer from the data. It also used visualizing privacy policies, which can rate privacy policies based on different assessment schemes. Lastly, they used personal visualizations which gained the additional value of the collected data.

d. If the paper includes a visualization system, summarize the system by the **What, Why, and How** questions that we often use in class.

System	LineUp
What:Data	Table
What: Derived	Ordered attribute, Rated by different factors
How: Encode	Bar charts, questionnaire, scatter plots, heat maps
How: Manipulate	Reorder, animated transitions, highlights
Why: Task	Show trends, distributions, rankings

e. What is the main **contribution** of the paper? That is, what has been done by the authors that were not possible before?

This paper allows everyone, including people who are not expert in Data, to know what kind of personal data they have, and what can be inferred from their personal data. This TransparencyVis has the potential effects of changing people's attitudes towards data leak. People used to have the attitude of neglecting that their personal data has been leaked because they do not know what this represents and what harmful aspects will it cause. However, with the new invention of this interface, users are able to track their personal data and discover the meaning behind it.

#3. What is your overall impression of IEEE Visualization 2020. Other than the three papers you choose, what other events have you attended? What do you learn from the conference overall?

I think IEEE Visualization 2020 is a beneficial event for everyone who is interested in Data Visualization. I used to think that paper presentations are hard to understand. However, the presentations on IEEE Visualization 2020 are all easy to understand and delivered clearly. I have also attended to "A Visual Analytics Based Decision Making Environment for COVID-19 Modeling and Visualization". Although there are already many visualizations about COVID-19, this one is still a great visualization to look at and learn from.

Overall, this is a great conference with visualizations from many disciplines. I used to think that visualizations are very limited, but that was not true. You can make visualization from as many aspects you want.