1. Introduction.
   1. Density maps are common in all types of visualizations: scatterplots, parallel coordinates, trajectories, etc. However, there is not enough study on the visualization of density plots.
   2. Existing methods (linear, gamma, or log mapping)
      1. Do not work for all situations: different features are lost and can be misleading.
      2. Are based on arbitrary mapping rather than human visual perceptions.
   3. We address the visualization of density maps by exploiting human visual perception. Our contributions:
      1. A visual perception-based model for density plot visualization.
      2. An efficient GPU-based implementation of the model
      3. User studies to show the effectiveness of our method [will be in the paper, not in the thesis]
   4. Benefits of our method include:
      1. Perceptually-based feature preservation in density maps: show details with tone mapping while keep the perceived intensity difference by glares.
      2. Data-independent, therefore is applicable to existing vis pipelines.
      3. Simple user-interactions (one slider?)
2. Related Work (Add references you’ve read that are not listed here) [Summarize what each method does briefly. DO NOT explain technical details]
   1. Density map visualization:
      1. discrete representations: cite[1][2][3];
      2. continuous representations: cite [4][5]
   2. Tone mapping techniques: cite [6][7] Cite the survey: [11] and other tone mappers in the pfs tool.
   3. Glare simulation: cite [8][9] and the other papers you found
   4. Scale space: cite[10]
3. Motivation
   1. A perceptual-based
4. Perceptual High–Dynamic-Range Density Map Visualization Model
   1. An overview with the pipeline and notions of each image involved
   2. Subsections of detailed math of each part of the model.
   3. In the tone-mapping stage, explain why we choose the current technique (it has better perceptual basis and works better for point data). Also mention that we’ve tried the Reinhard‘s method which doesn’t work with image result from that method (so that your effort is not wasted).
5. Interactions
   1. Argue that the method requires few interactions, and interactions are easy and intuitive.
   2. Explain what can be tuned in the pipeline by the user and show the effects of different settings with figures. (e.g., how to choose what blobs to lit?)
6. GPU-based Implementation
   1. Details on GPU implementation of each stage
   2. Some timings
7. The HDR-ToolKit System
   1. On top of the method with GPU implementation, we created an easy-to-use interactive HDR image viewing system
   2. Explain each part of the system GUI
8. Examples and Evaluations
   1. Show examples of scatterplots (also scatterplot matrix), parallel coordinates, and trajectories.
   2. The impact of colors: compare same data with and without colors to show that our method also works with colors.
   3. Compare with existing techniques (linear, log, gamma, bare tone-mappings [all can be done with the Luminance tool]).
9. Conclusions
   1. We have introduced a Perceptual High–Dynamic-Range Density Map Visualization method. Basically a short summarization of the introduction.
10. Future work
    1. User study.
    2. Differentiate luminance between glares.

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