

Automating Data Visualization



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Nick Holliman @Binocularity

Professor of Visualization, Newcastle University
Fellow of The Alan Turing Institute, London

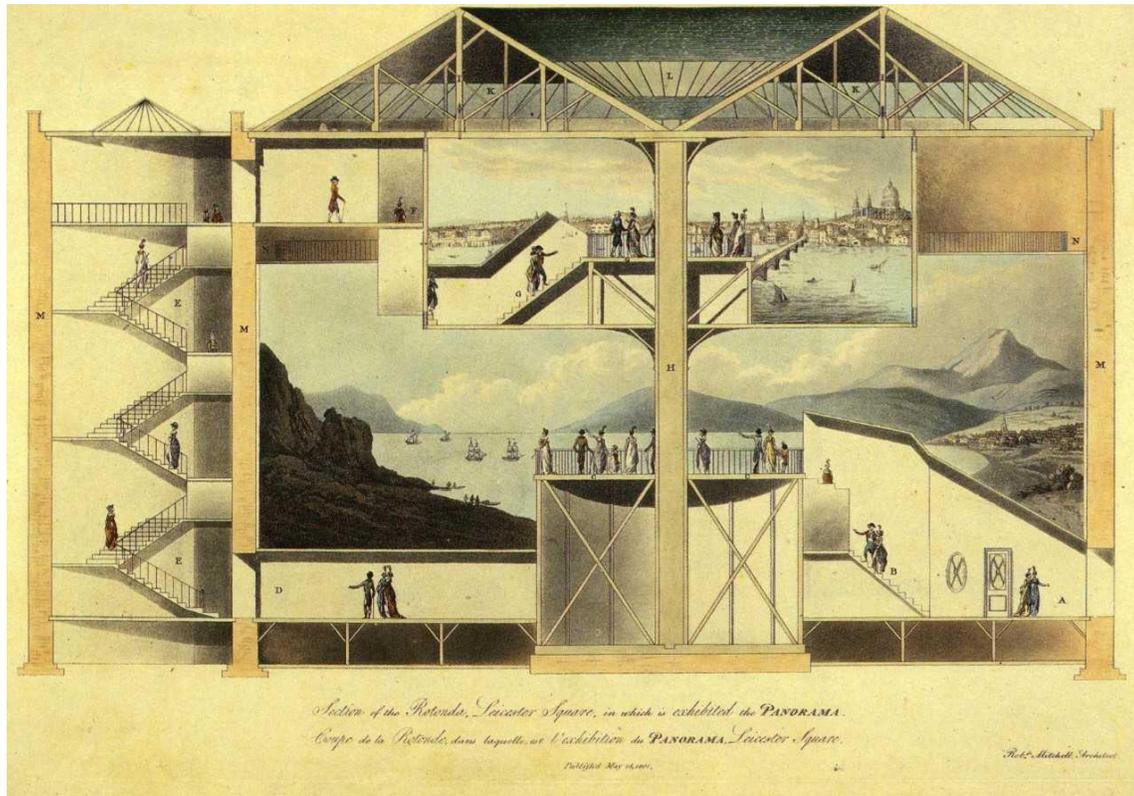
What is Data Visualization?



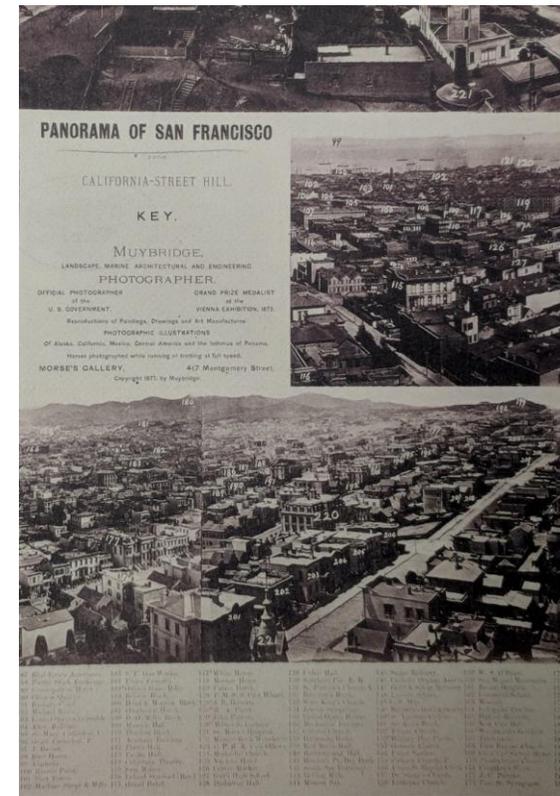
Big-data is getting bigger, but humans still need to be able to access, use and assess data.

History of panoramic images for urban data-scapes

How can we represent urban data so that is widely accessible and contains an ability to be viewed at multiple scales?



Robert Barker, 1787, granted first patent on panoramic imaging, with the aim of immersing visitors in an (urban) scene.



In 1877 Eadweard Muybridge took cityscape panoramas of San Francisco, labelling every building in the key.

#TeraScope: Terapixel image of digital twin accessible on any device



Curtin HIVE (Perth, WA)
180 deg 3m x 8m projection wall

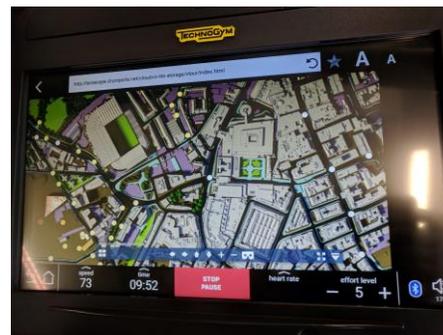
Created one of the largest super-computers on earth in the cloud.



Smart phone Pixel 2 XL



Samsung Galaxy Tab S3



Gym cycling machine

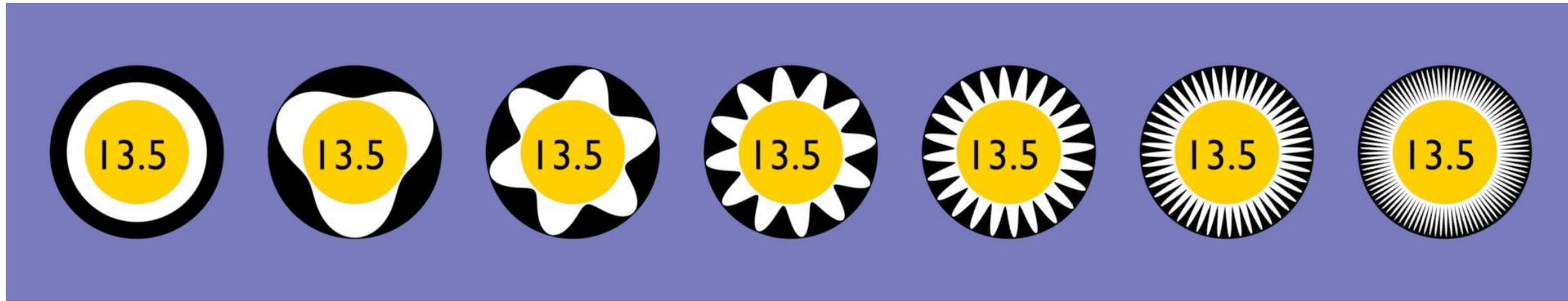


Exeter Digital Humanities Lab
18M pixel LCD display wall

<http://terascope.di-projects.net/cloudviz-tile-storage-1024/vtour/index.html>

<https://arxiv.org/abs/1902.04820>

Communicating trustworthiness: glyphs for representing uncertainty



Generator	0	3	6	12	24	48	96
SampEnt n=2, r=0.2	0	0.01	0.02	0.03	0.07	0.17	0.26
BT Ability	0	1.9054	2.3127	2.7892	3.1662	3.4986	3.8355
Uncertainty Mapping	Gold standard	Strong certainty	Moderate certainty	Weak certainty	Uncertain	Strong Uncertainty	Extreme Uncertainty

Testing the concept of *visual entropy* as a novel way to enhance usability and communicate information in visualizations.

Testing glyph designs for a 3D Atlas that incorporate uncertainty.



Data layout for digital twins: How can we present big data in context.



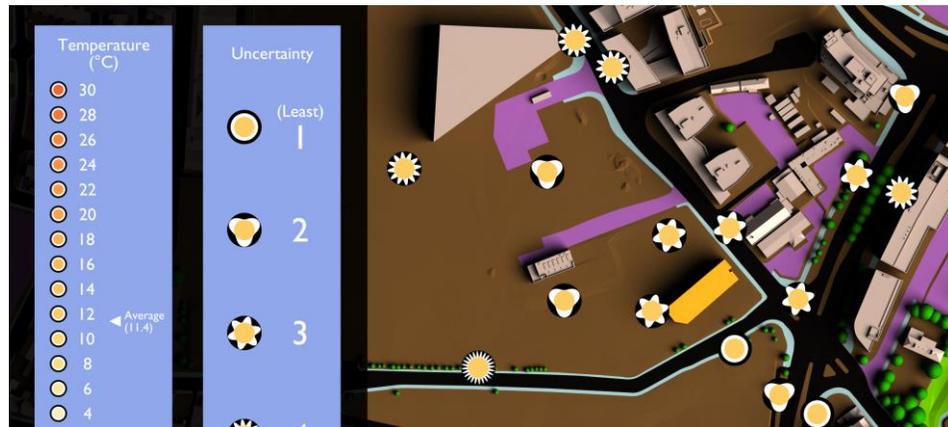
How Visualization can help Data Science and Artificial Intelligence



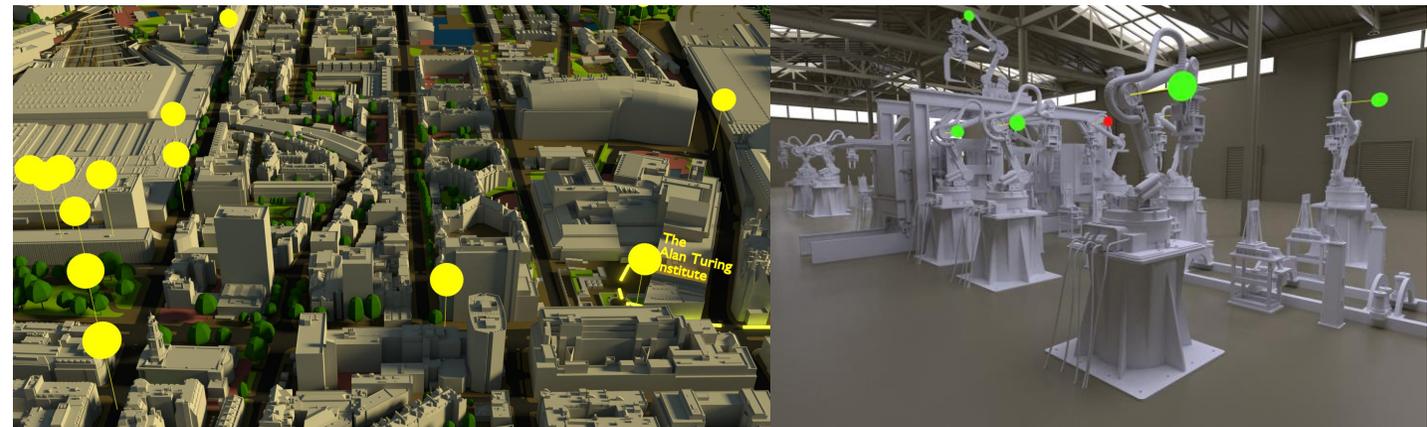
Bridging the data gap from the digital to humans



Enhance accessibility: render engaging and available presentations.



Enhance usability: communicate uncertainty to improve the trustworthiness of data/AI.



Enhance assessibility: automate layout of data in digital twins using stochastic optimization for improved human decision making.