

Scientific Visualization (Assignment 2)

Exercise 2. 1 Visualization Pipeline [2 Points]



Explain what happens in each step of the visualization pipeline for the above visualization of wind flow in a city. ¹.

Exercise 2. 2 Data Representation [3 Points]

An important step in visualization is the classification of the data that will be visualized. Provide the data domain dimensionality, attribute dimensionality and the attribute scale type (nominal, ordinal, interval, ratio) for the following examples. Give reasons for your choice.

1. Celsius temperature of a thin heated rod.
2. Positions of stars in the Milky Way galaxy.
3. Weather condition map (rain, snow, sunny. . .) of Europe.
4. Air flow around a car.
5. Current time at every point on Earth.

¹Interactive Realtime Pathtracing in ParaView using NVIDIA RTX - Dynamic Geometry. *source:* <https://www.youtube.com/watch?v=Hv0Sye8OK7g>

Exercise 2. 3 Data Properties [4 Points]

Four data sets *Data1.csv* to *Data4.csv* are given in the same folder as the assignment. Using Python and NumPy compute the following statistical properties:

- Mean
- Variance
- Correlation
- Linear regression (line coefficients)

For each dataset generate a figure with Matplotlib, plotting the data and the computed line. Display the mean, the variance and the correlation values in the figure title.

Usage of built-in NumPy functions is encouraged but not required. Please use Python 3.0+, not the older Python 2.7. The easiest way to setup Python 3.0+ and NumPy on Windows is to install Anaconda.

Upload your python script and a screenshot of the figure to ILIAS.

Submission Deadline: 08.05.2020, 23:55

please hand in your submission through the ILIAS system.