

University College Cork



## CS3205 Lab Report 1

### HDI Trends and Multidimensional Projections

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# 1 Introduction

## 1.1 The Problem

the problem

## 1.2 The Datasets

the datasets

## 1.3 The Role of Visualisations

the role of visualisations

# 2 Data Description

## 2.1 hdr.xlsx

Description of data.

## 2.2 hdi.csv

Description of data.

# 3 Task 1

## 3.1 Free Exploration

In the free exploration section of the assignment I have created visualisations which give a broad overview of the general distribution of HDI across countries when looking at specific attributes of those countries.

Each of the following visualisations will include:

- A graphic
- A description of a pattern (or lack of)
- A hypothesis as to the cause of this pattern
- The dataset from which the data came

### 3.1.1 HDI Histogram

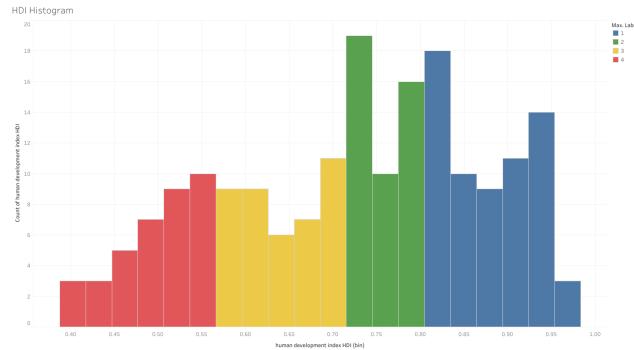


Figure 3.1: my hdi caption

### 3.1.2 HDI Global Heatmap

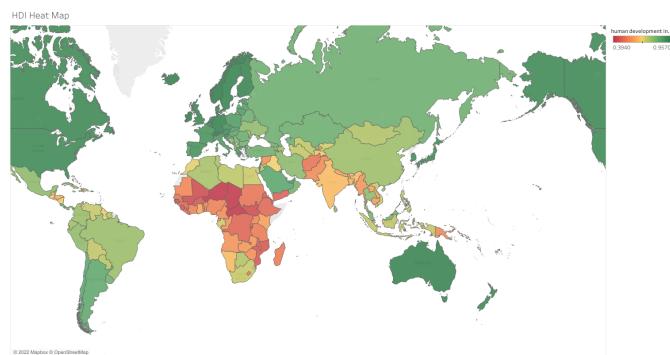


Figure 3.2: what a pretty map

### 3.1.3 Average HDI Trend

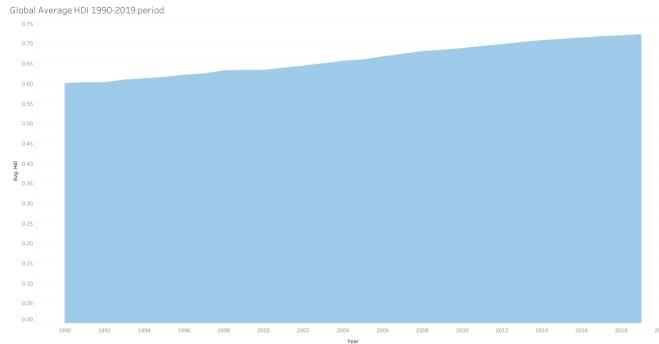


Figure 3.3: no dips

### 3.1.5 Male/Female Mean Years Education

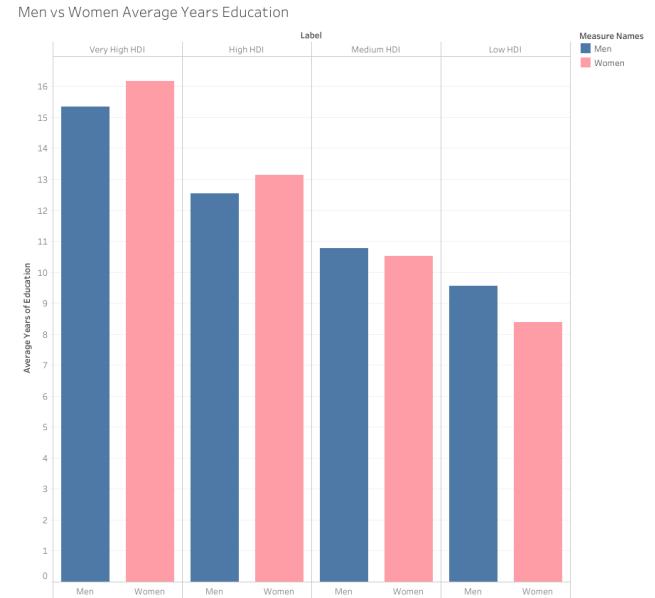


Figure 3.5: girl power

### 3.1.4 Min/Max HDI

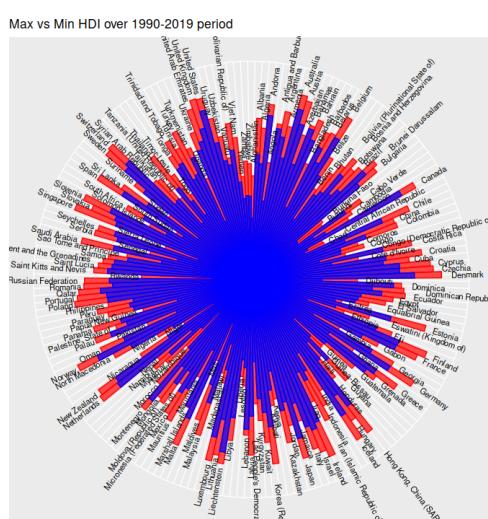


Figure 3.4: going in circles

## 3.2 Specific Observations

In the specific observations section of the assignment I have created visualisaions in line with the task list specifications.

### 3.2.1 Spurious Values

#### Expected Population Growth

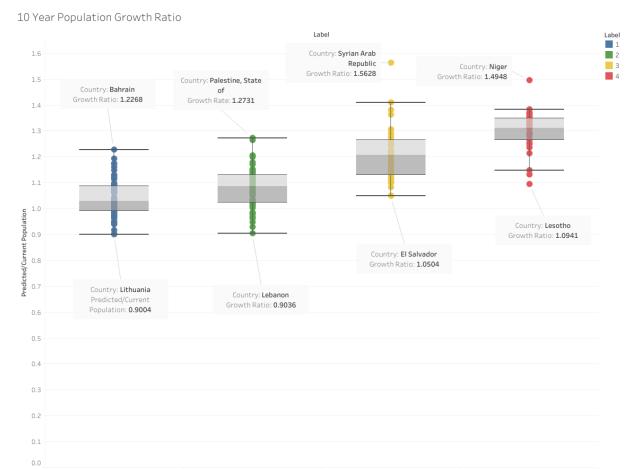


Figure 3.6: sexy visual spurious values

### Mean vs Expected Years Schooling

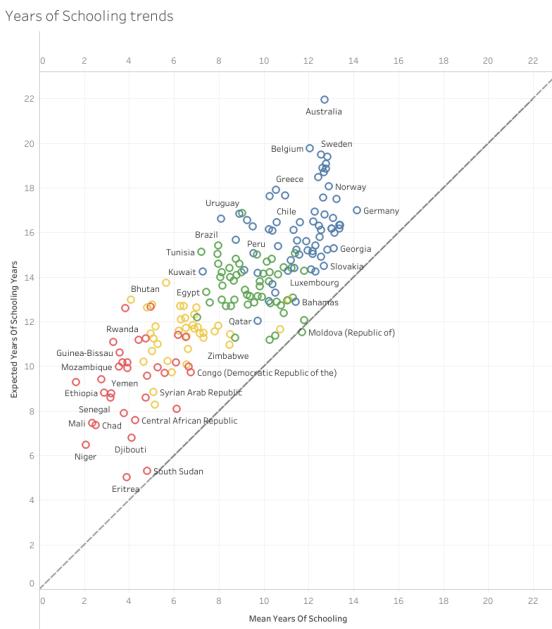


Figure 3.7: spurious value 2

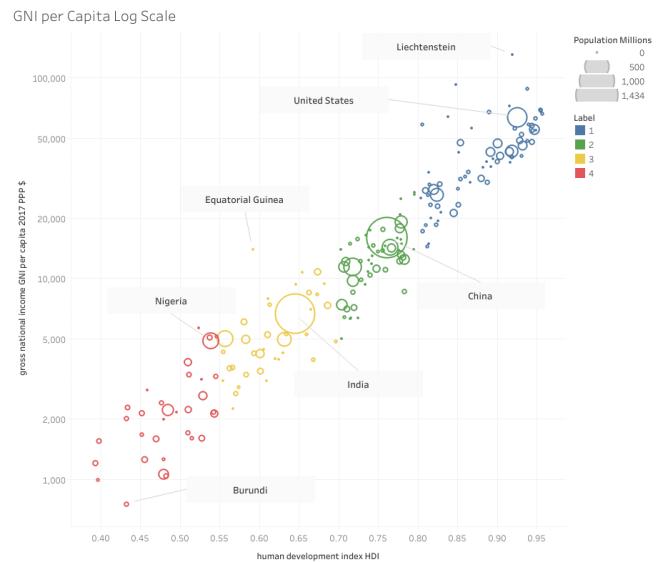


Figure 3.9: GNI accounts almost totally for HDI

### 3.2.2 Correlated Attributes

## Fertility Rate vs Adolescent Birth Rate

### 3.2.3 Uncorrelated Attributes

## Women Share of Seats in Government vs Average Years Education

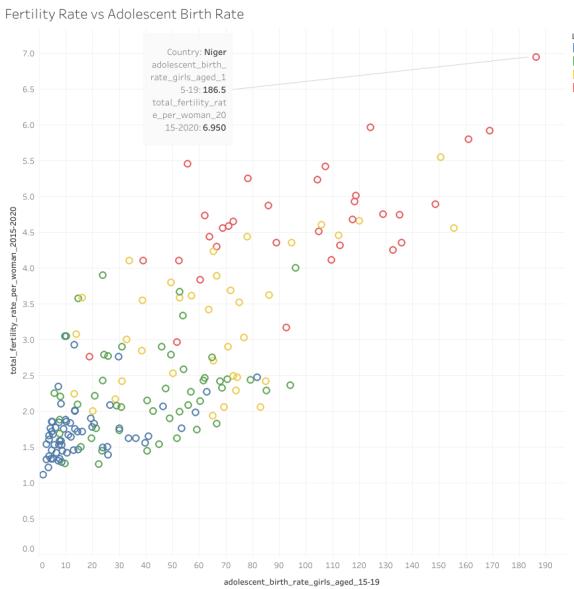


Figure 3.8: Early have children more children you have

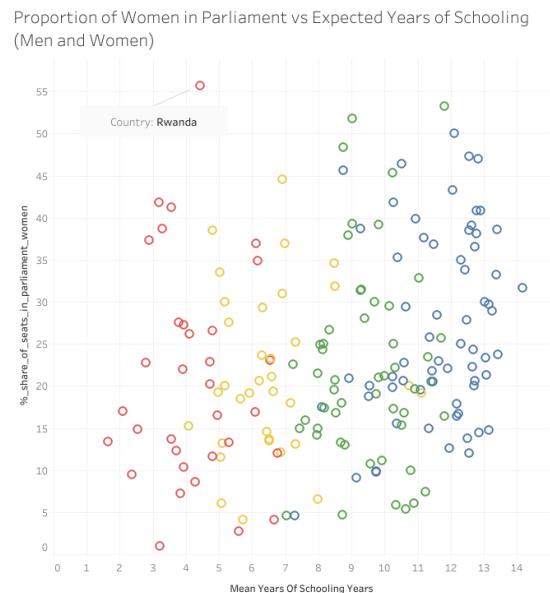


Figure 3.10: Surprising

## HDI vs Gross National Income

## Labour Force Participation vs GDP

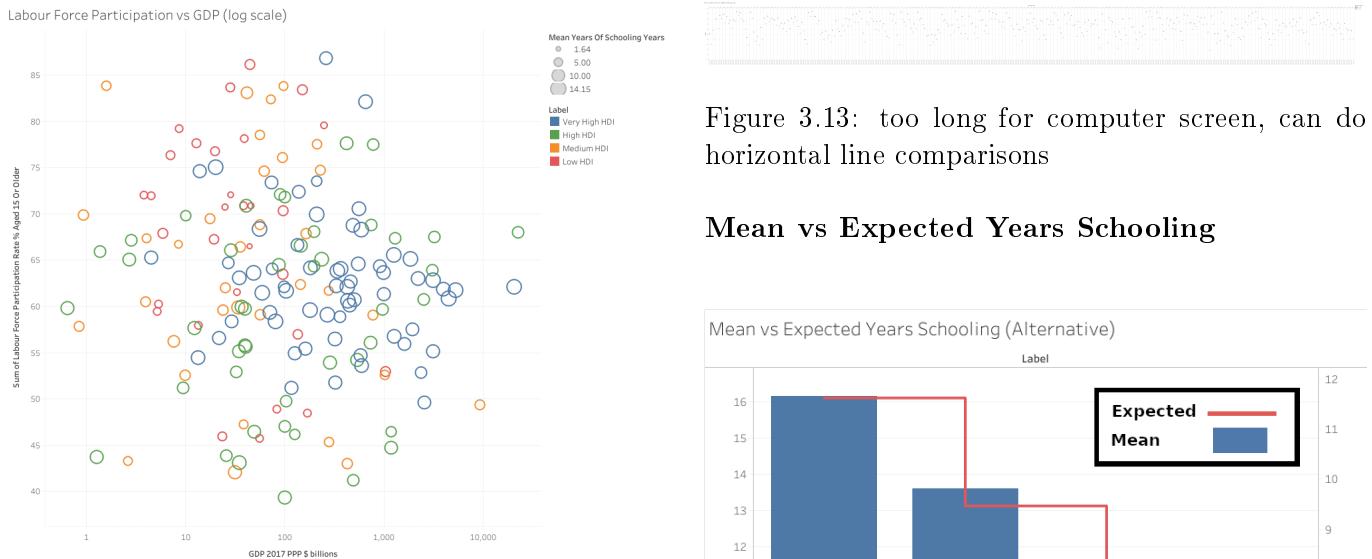


Figure 3.11: Surprising

### 3.2.4 Hypotheses for Previous Patterns

#### Health Expenditure ordered by Life Expectancy



Figure 3.12: think of caption

### 3.2.5 Usefulness of All Visualisations

#### 3.2.6 Alternative Visualisations

##### Min/Max HDI Alternative



Figure 3.13: too long for computer screen, can do horizontal line comparisons

### Mean vs Expected Years Schooling

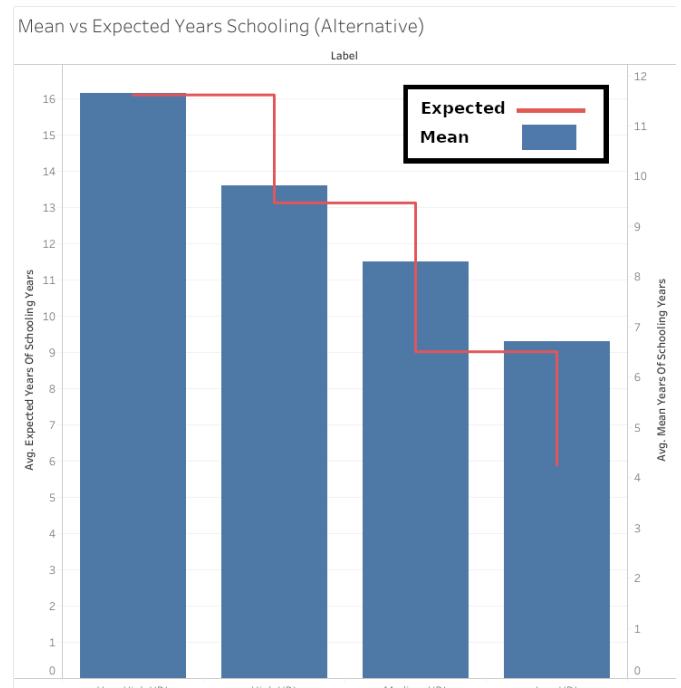


Figure 3.14: Lose individual countries

## 4 Task 2

Results for task 2.

### 4.1 Corel Projections Comparison

#### 4.1.1 LSP

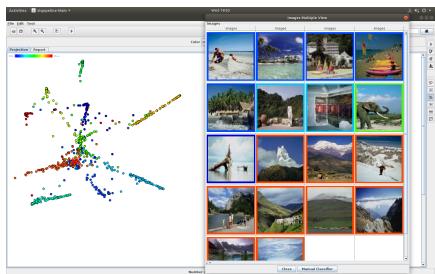


Figure 4.1: First projection

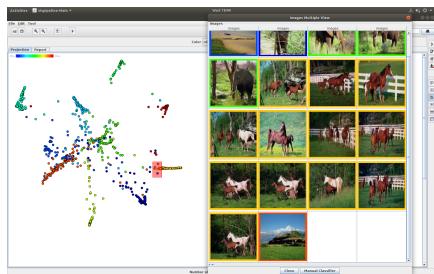


Figure 4.3: Second projection



Figure 4.5: Third projection

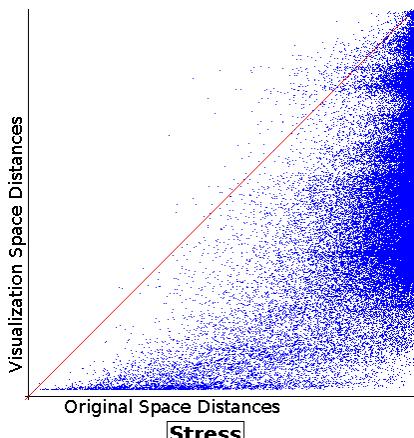


Figure 4.2: Stress Curve

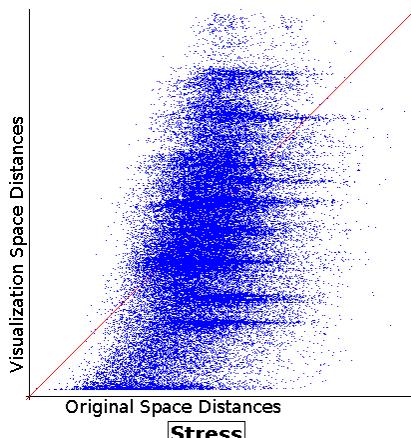


Figure 4.4: Stress Curve

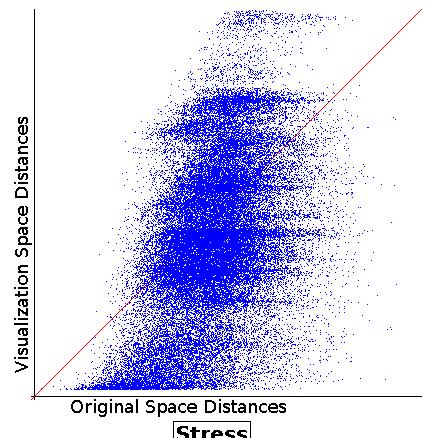


Figure 4.6: Stress Curve

#### 4.1.2 t-SNE

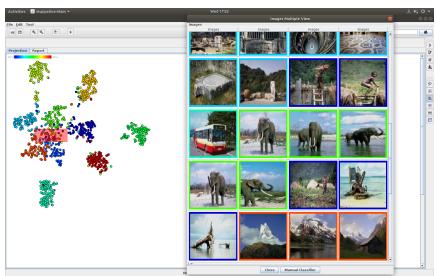


Figure 4.7: First projection

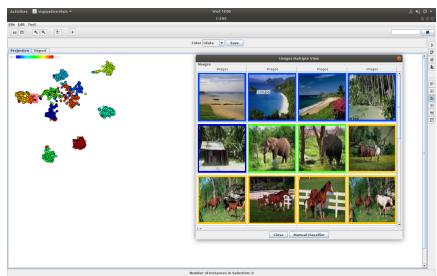


Figure 4.9: Second projection

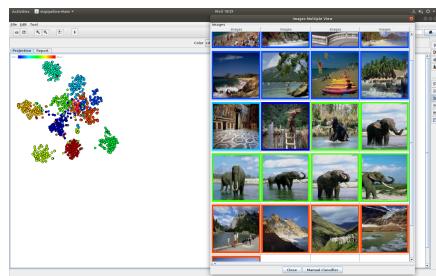


Figure 4.11: Third projection

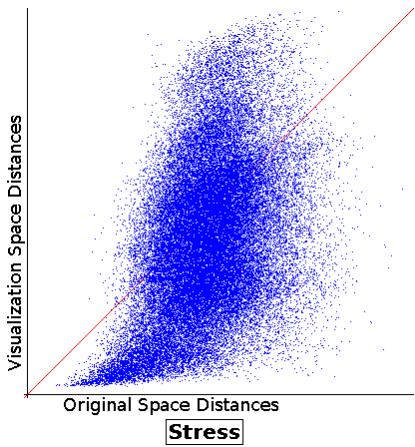


Figure 4.8: Stress Curve

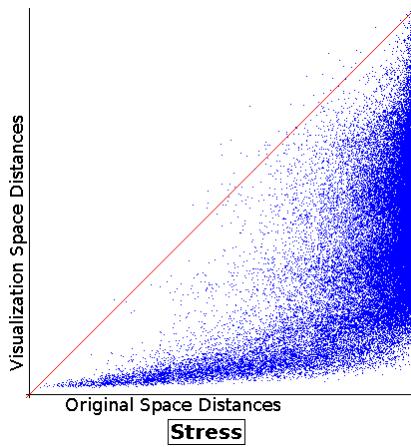


Figure 4.10: Stress Curve

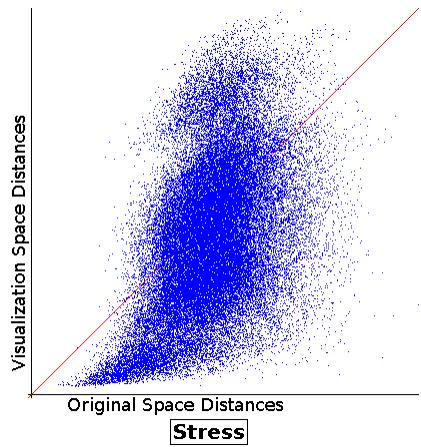


Figure 4.12: Stress Curve

### 4.1.3 PCA

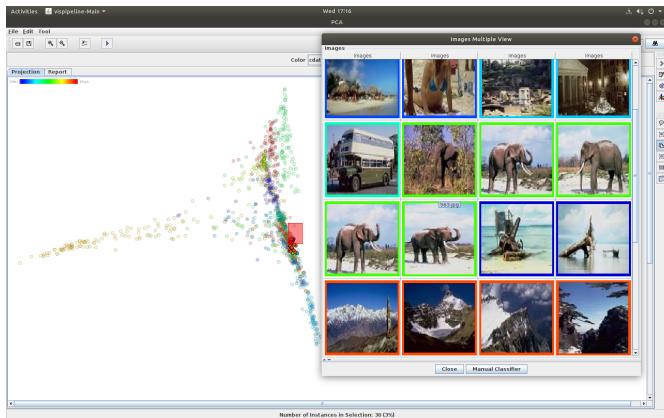


Figure 4.13: First projection

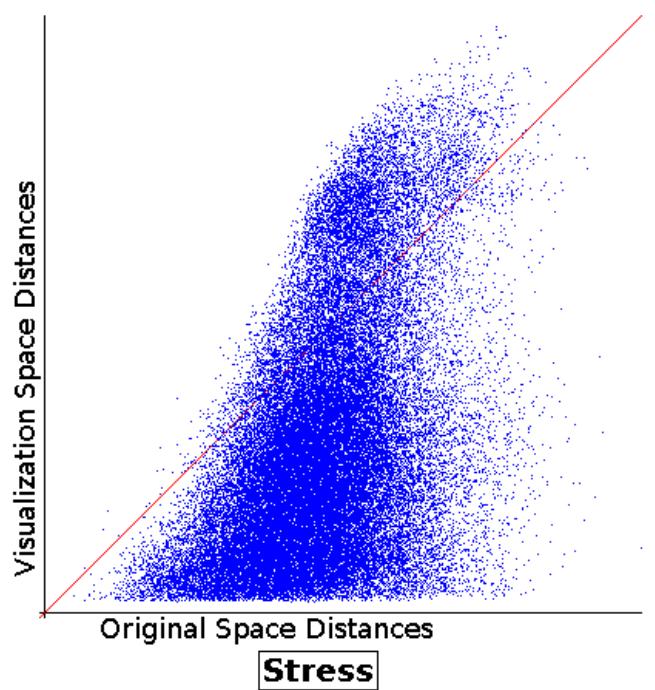


Figure 4.14: Stress Curve

## 4.2 CBR Projections Comparison

### 4.2.1 LSP

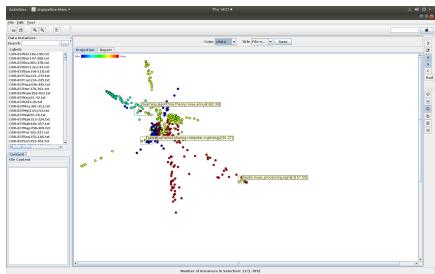


Figure 4.15: First projection

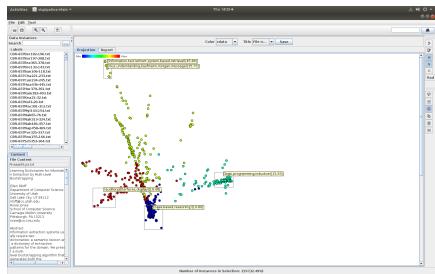


Figure 4.17: Second projection

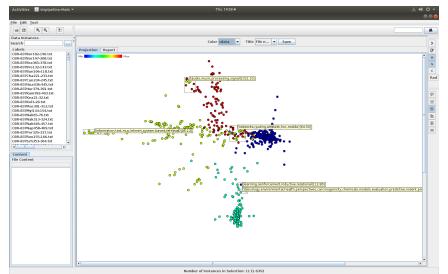


Figure 4.19: Third projection

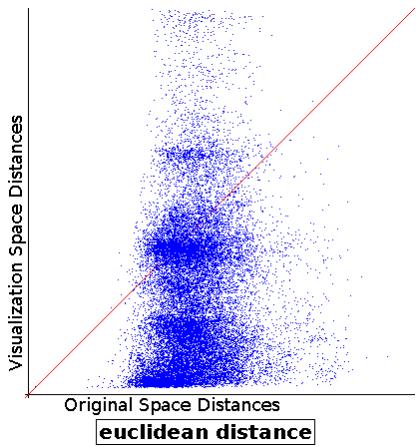


Figure 4.16: Stress Curve

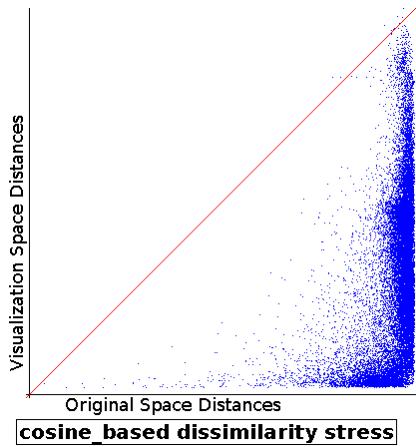


Figure 4.18: Stress Curve

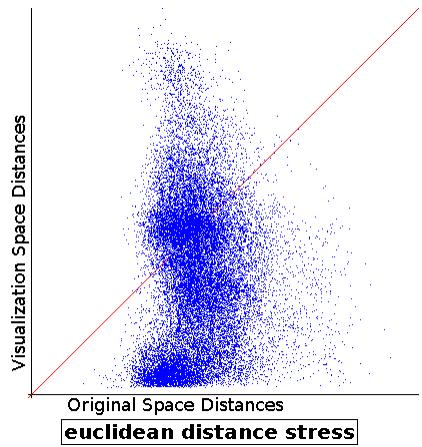


Figure 4.20: Stress Curve

#### 4.2.2 t-SNE

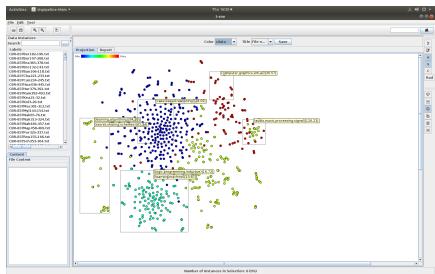


Figure 4.21: First projection

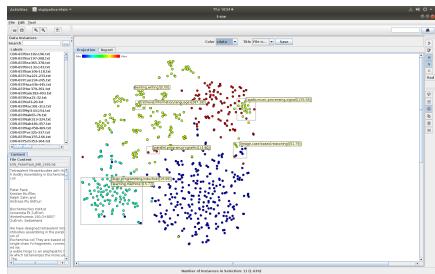


Figure 4.23: Second projection

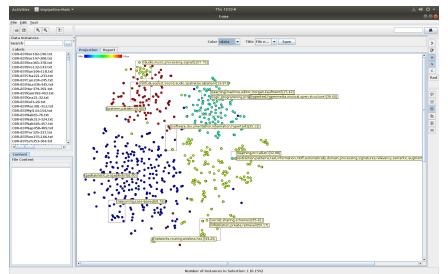


Figure 4.25: Third projection

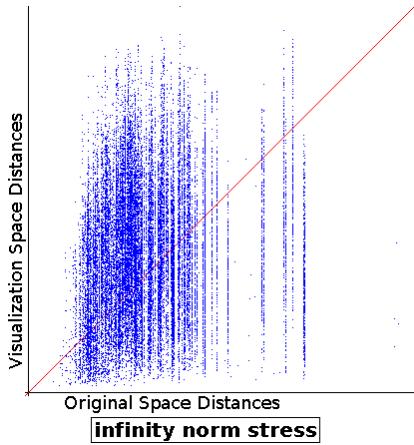


Figure 4.22: Stress Curve

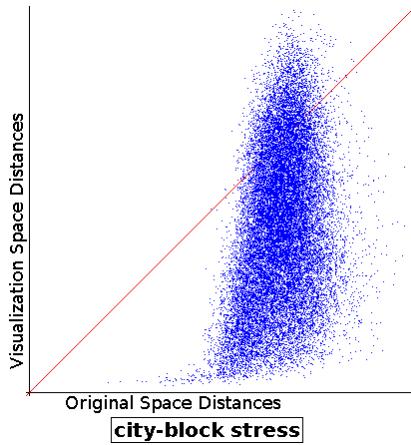


Figure 4.24: Stress Curve

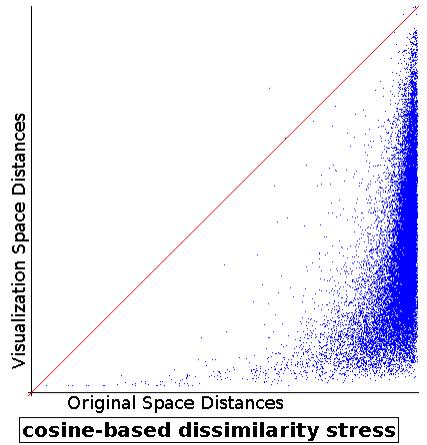


Figure 4.26: Stress Curve

### 4.2.3 ProjClus

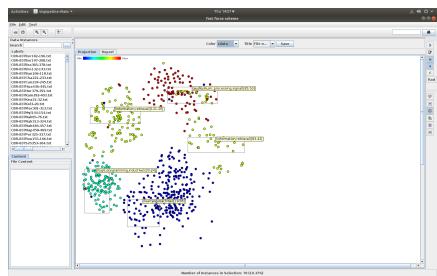


Figure 4.27: First projection

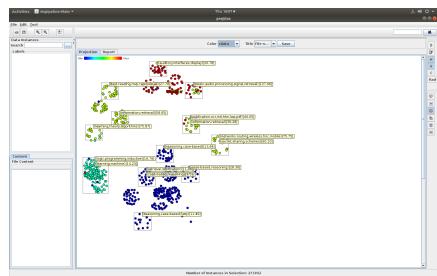


Figure 4.29: Second projection

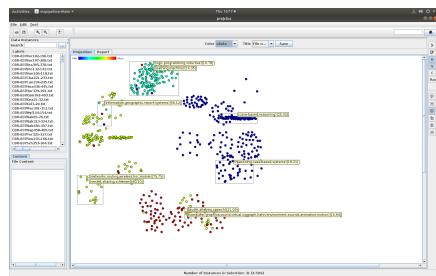


Figure 4.31: Third projection

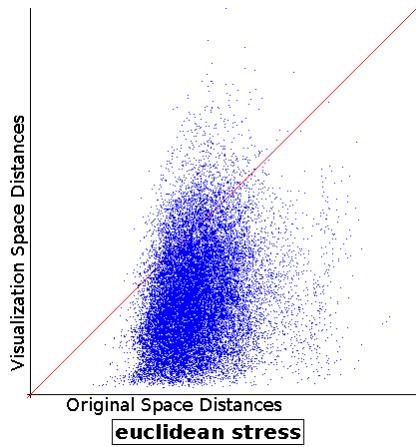


Figure 4.28: Stress Curve

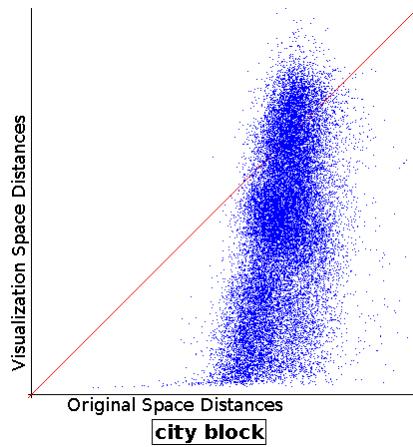


Figure 4.30: Stress Curve

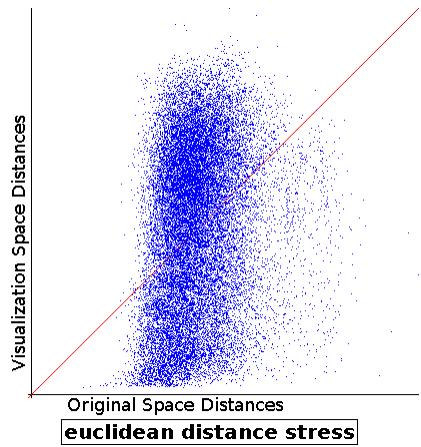


Figure 4.32: Stress Curve

## 4.3 Medical Images Projections Comparison

### 4.3.1 LSP

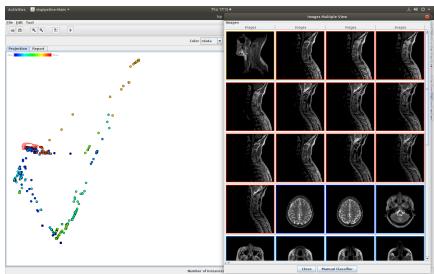


Figure 4.33: First projection

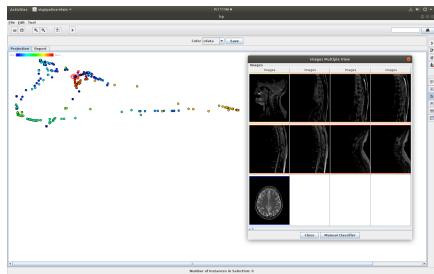


Figure 4.35: Second projection

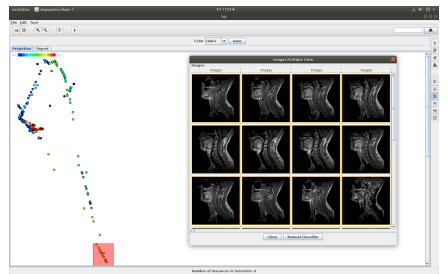


Figure 4.37: Third projection

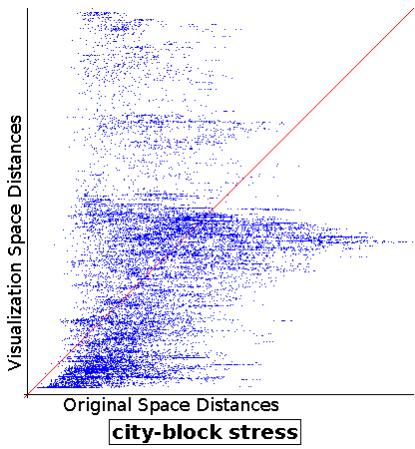


Figure 4.34: Stress Curve

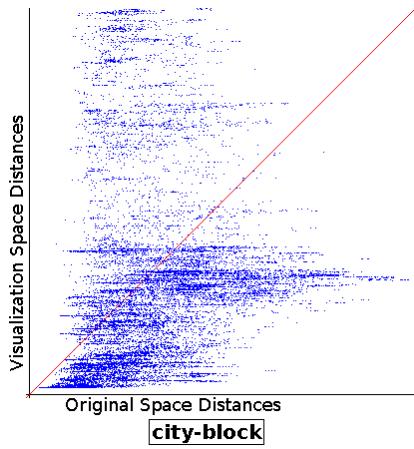


Figure 4.36: Stress Curve

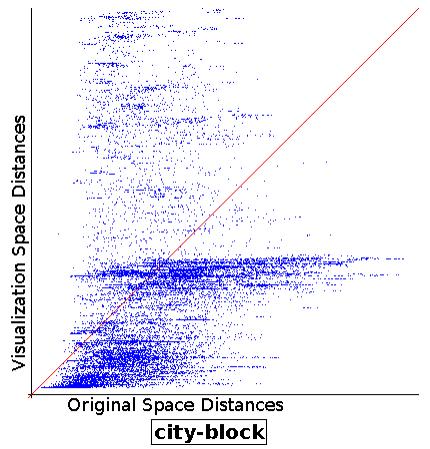


Figure 4.38: Stress Curve

#### 4.3.2 t-SNE

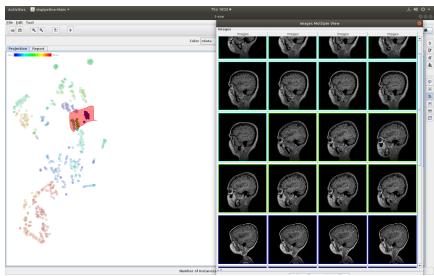


Figure 4.39: First projection

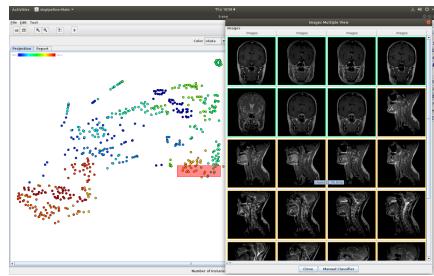


Figure 4.41: Second projection

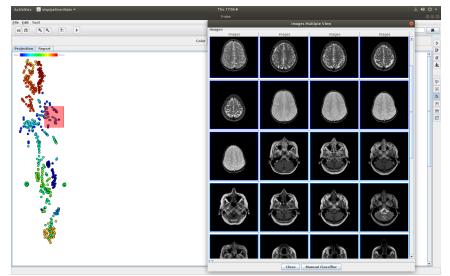


Figure 4.43: Third projection

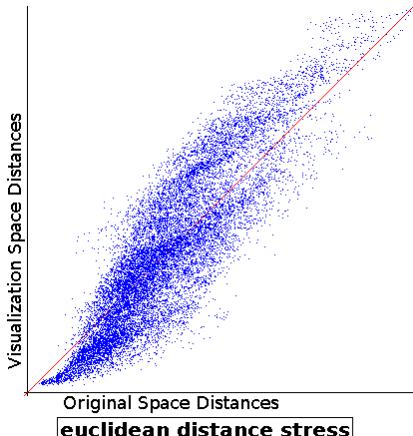


Figure 4.40: Stress Curve

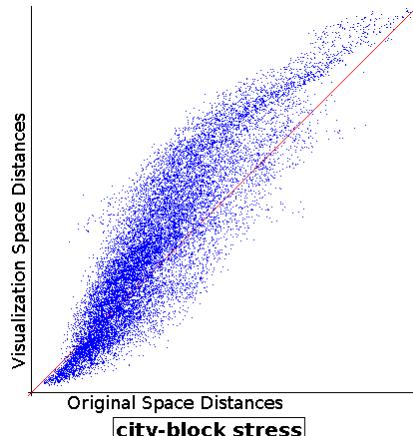


Figure 4.42: Stress Curve

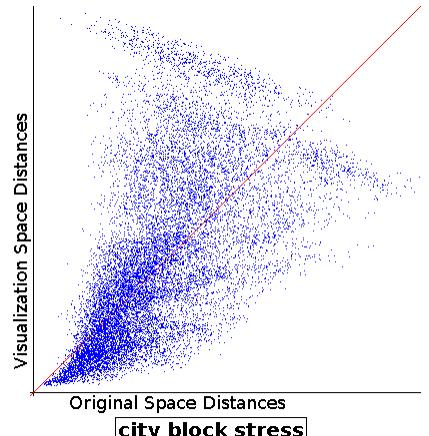


Figure 4.44: Stress Curve

### 4.3.3 PCA

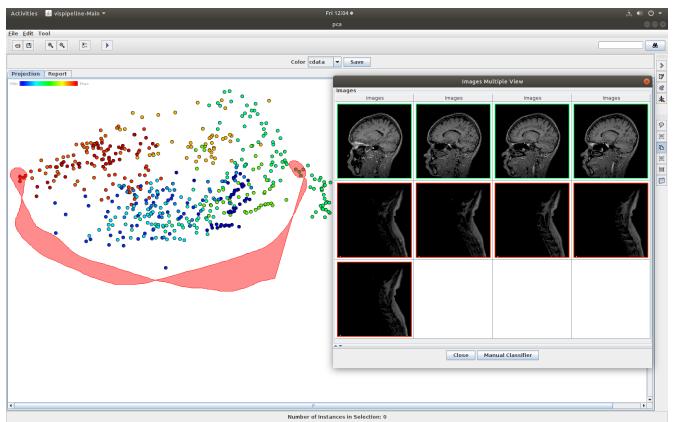


Figure 4.45: First projection

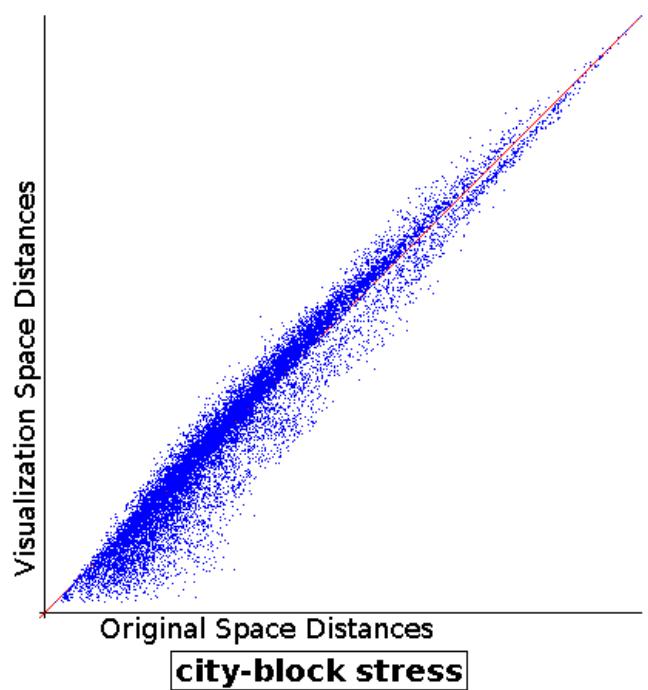


Figure 4.46: Stress Curve

## 4.4 News Headlines Projections Comparison

### 4.4.1 LSP

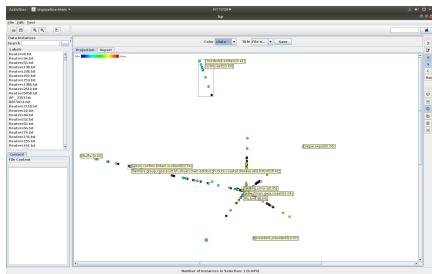


Figure 4.47: First projection

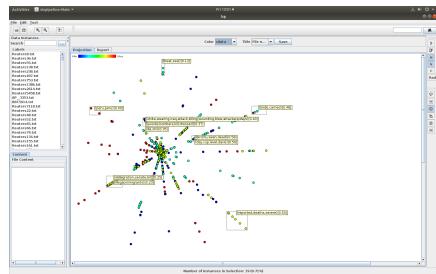


Figure 4.49: Second projection

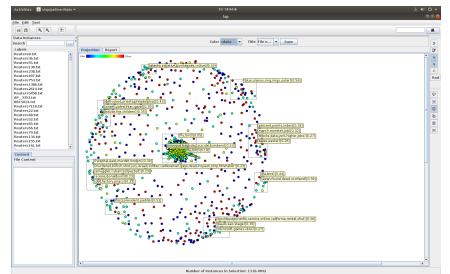


Figure 4.51: Third projection

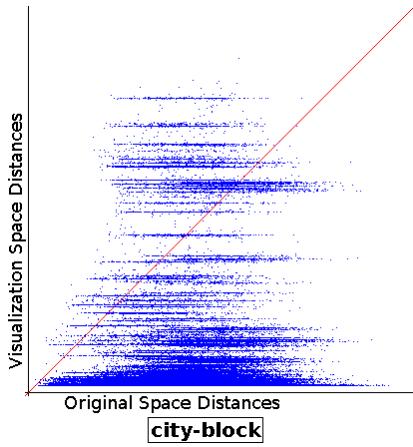


Figure 4.48: Stress Curve

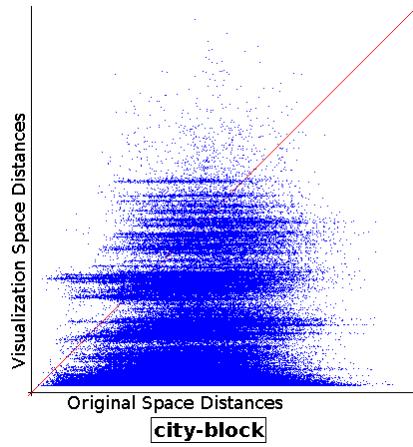


Figure 4.50: Stress Curve

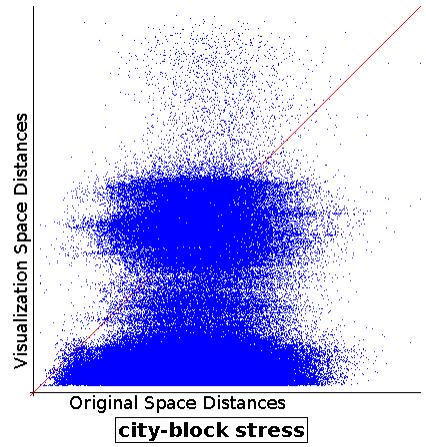


Figure 4.52: Stress Curve

#### 4.4.2 t-SNE

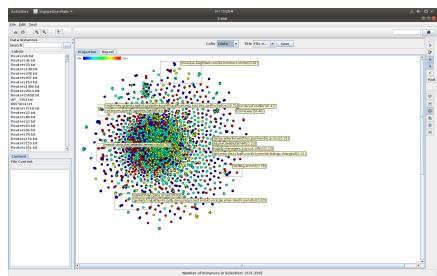


Figure 4.53: First projection

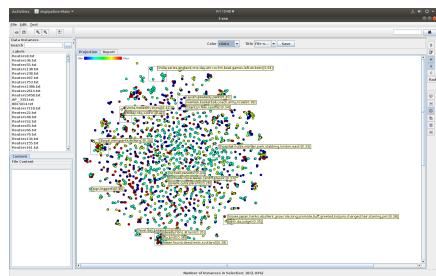


Figure 4.55: Second projection

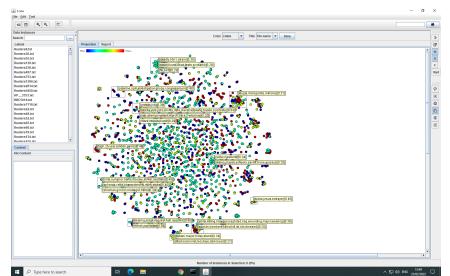


Figure 4.57: Third projection

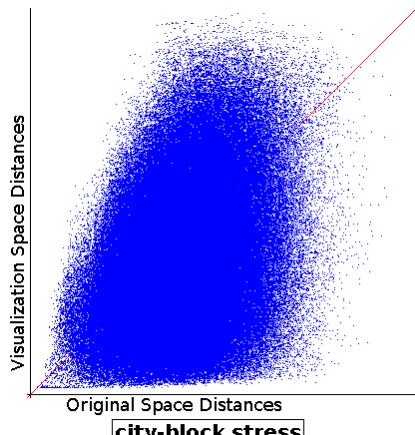


Figure 4.54: Stress Curve

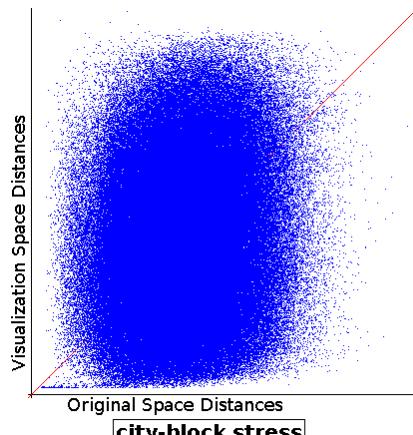


Figure 4.56: Stress Curve

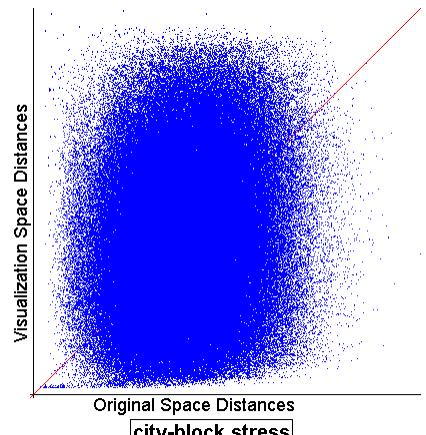


Figure 4.58: Stress Curve

#### 4.4.3 ProjClus

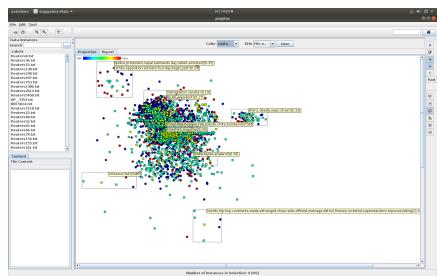


Figure 4.59: First projection

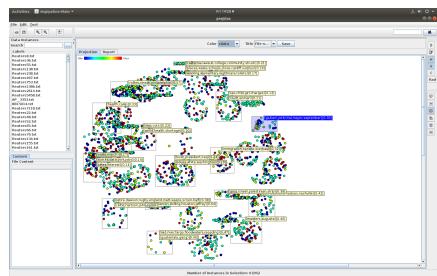


Figure 4.61: Second projection

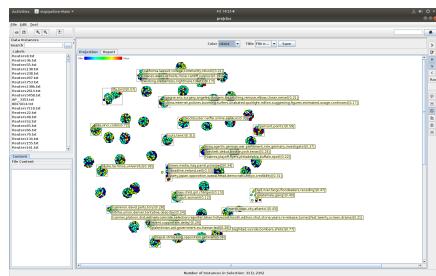


Figure 4.63: Third projection

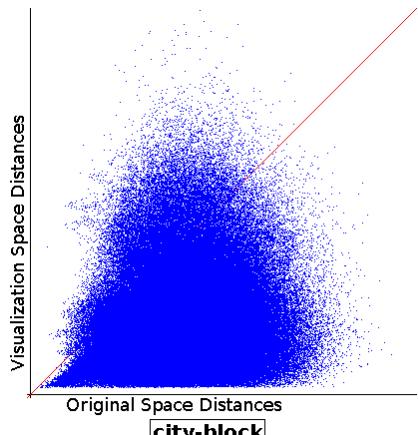


Figure 4.60: Stress Curve

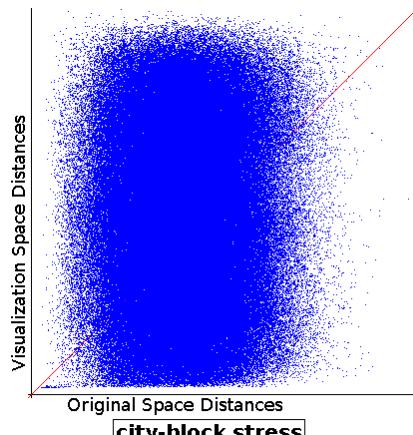


Figure 4.62: Stress Curve

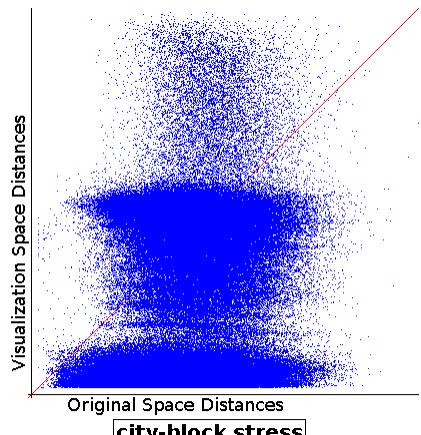


Figure 4.64: Stress Curve

## 4.5 Projections of HDR

### 4.5.1 LSP

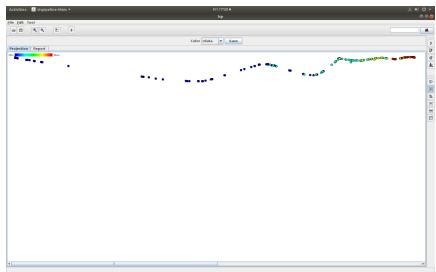


Figure 4.65: First projection

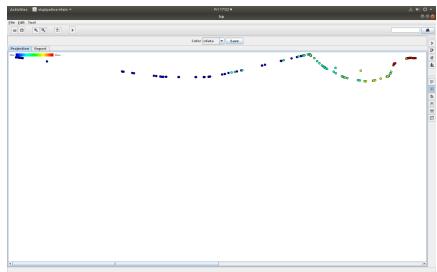


Figure 4.67: Second projection

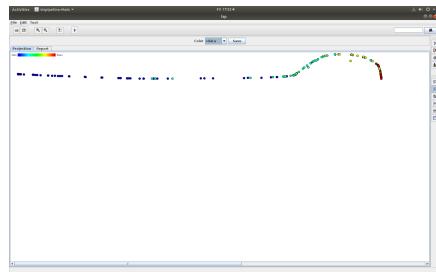


Figure 4.69: Third projection

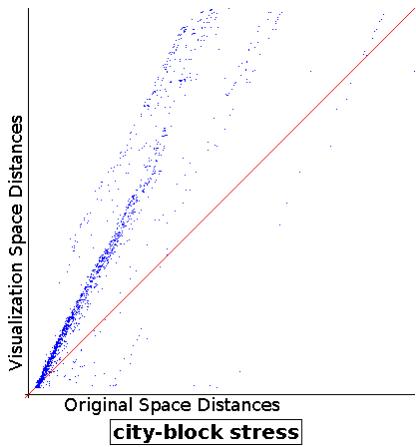


Figure 4.66: Stress Curve

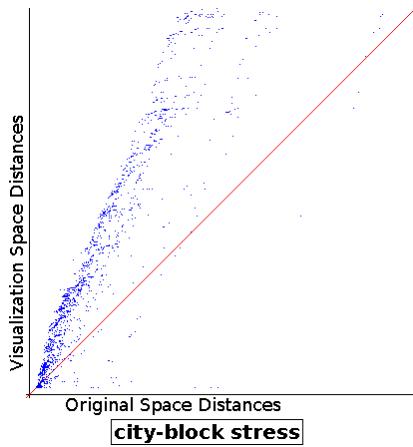


Figure 4.68: Stress Curve

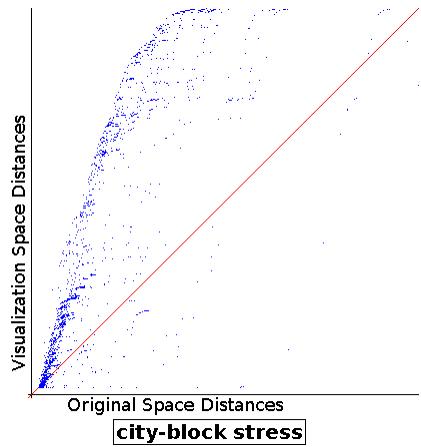


Figure 4.70: Stress Curve

#### 4.5.2 t-SNE

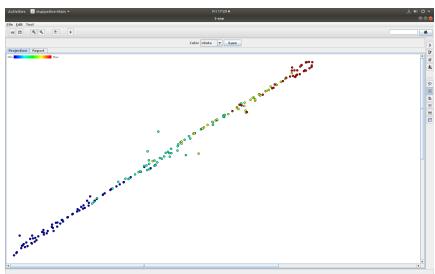


Figure 4.71: First projection

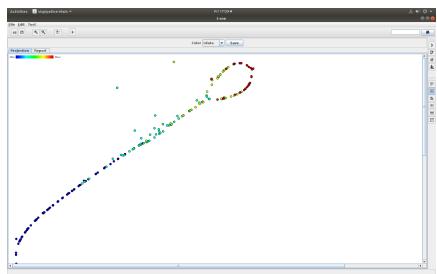


Figure 4.73: Second projection

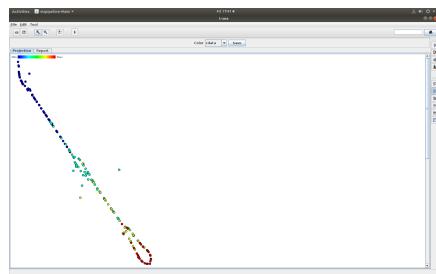


Figure 4.75: Third projection

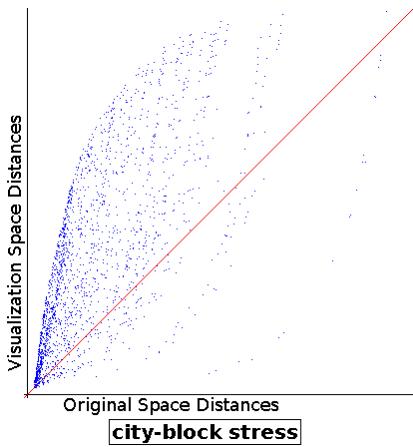


Figure 4.72: Stress Curve

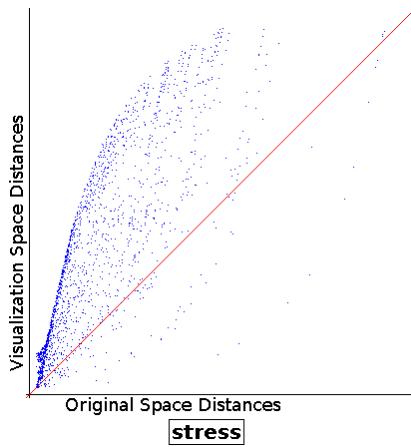


Figure 4.74: Stress Curve

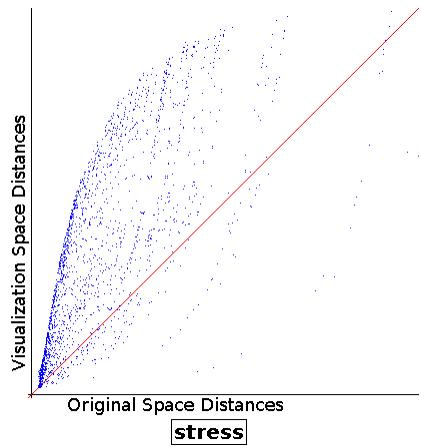


Figure 4.76: Stress Curve

#### 4.5.3 PCA

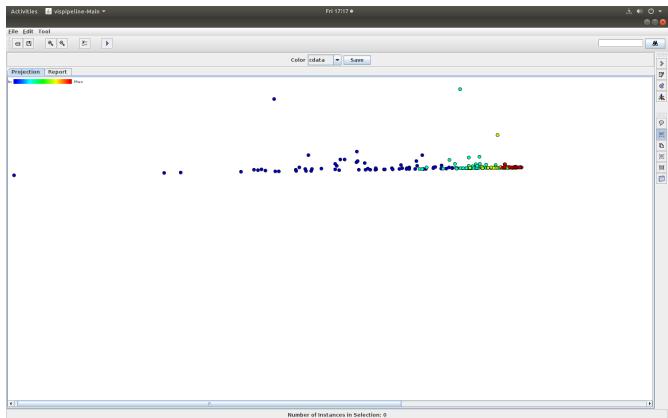


Figure 4.77: First projection

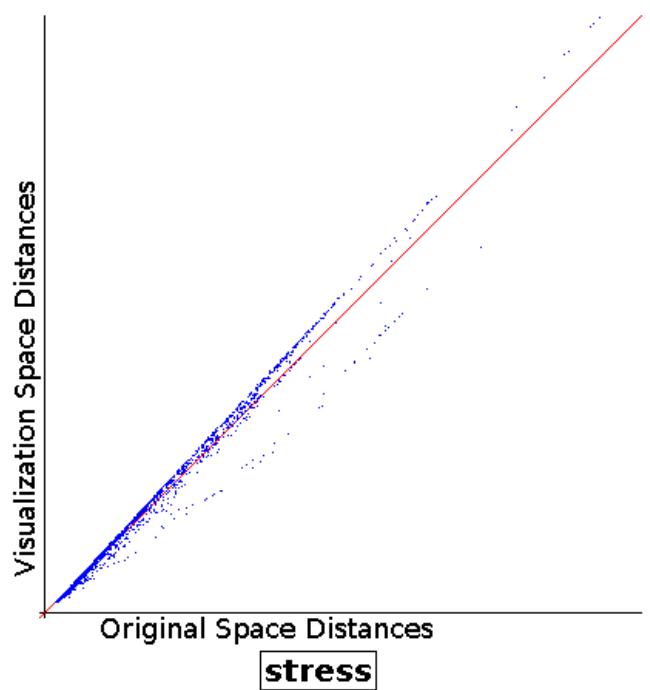


Figure 4.78: Stress Curve

## 5 Conclusions

Conclusions from overall assignment, emphasis on data sets, exercises and using visualisations.

## 6 References

References?