Steerable Parallel Coordinates in JavaScript

Group 1:

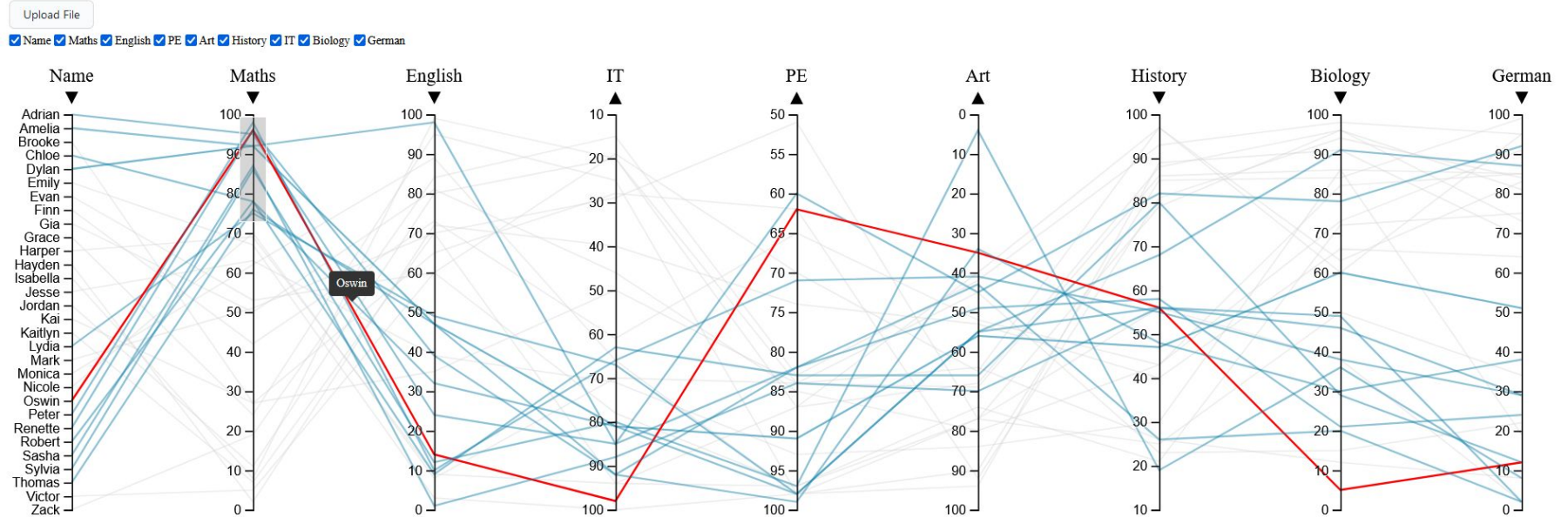|	
Drescher	Philipp
Kleinschuster	Jeremias
Schreiner	Sebastian
Vrella	Burim

Agenda

- Motivation and Background

- Results

- Example Implementation

- Outlook

Motivation and Background

What are Parallel Coordinates?

A common way to depict multidimensional data.

Why Steerable?

- Ability to manipulate and customize the visualization from outside:
  - Dynamically adjust parameters
  - No direct interaction with the figure needed

- End goal of implementing and explorable explainer.

- Technical Details
  - Javascript library
    - D3.js to create SVG
    - D3.parcoords.js to interact with the SVG
    - Scrollmagic to create Explorable Explainer
  - UI written in HTML and CSS
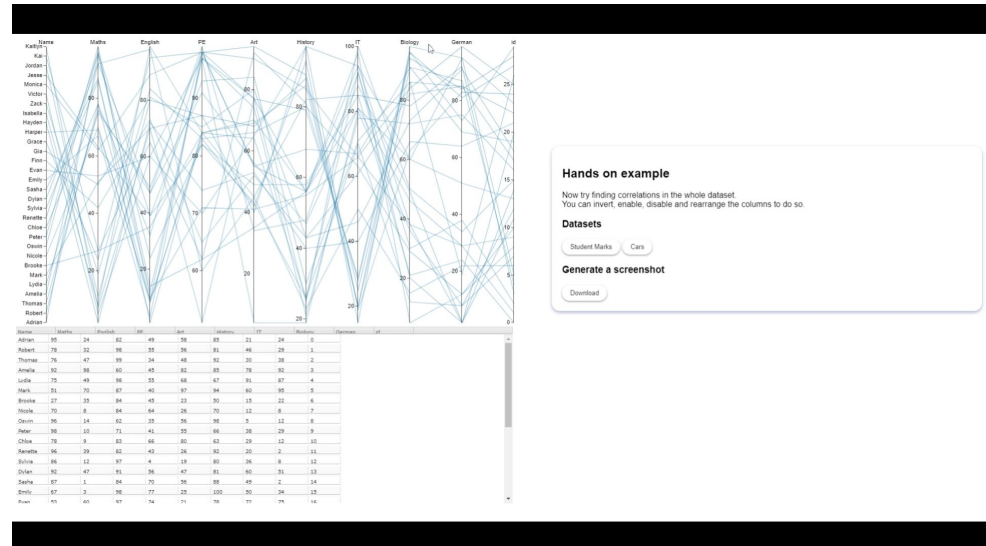
Showcase Video: youtu.be/4TjYrOp7-hI

Results

Library

- SteerableParcoords class
  - Implements different functions to steer plot properties

Class member functions:

- generateSVG()
- loadCSV(csv)
- invert(dimension)
- getInversionStatus(dimension)
- move(dimension, toRightOf, A)
- getDimensionPositions()

- getFilter(dimension)
- setFilter(dimension)
- getSelected()
- select(records)
- saveAsSVG()

Tools

Steerable Parallel Coordinates

- **TypeScript**
  - Programming Language
  - https://www.typescriptlang.org/

- **JavaScript**
  - Programming Language
  - https://www.javascript.com/

- **D3v7**
  - Library
  - https://d3js.org/

Explorable Explainer as Scrollable

- **JavaScript**
  - Programming Language
  - https://www.javascript.com/

- **Steerable Parallel Coordinates**
  - Library
  - https://github.com/syntagmatic/parallel-coordinates

- **D3v3**
  - Library
  - https://d3js.org/

- **Scrollmagic**
  - Library
  - https://scrollmagic.io/

Example Implementation

Dataset

- Curated dataset of student marks
  - Used to illustrate correlations using parallel coordinates
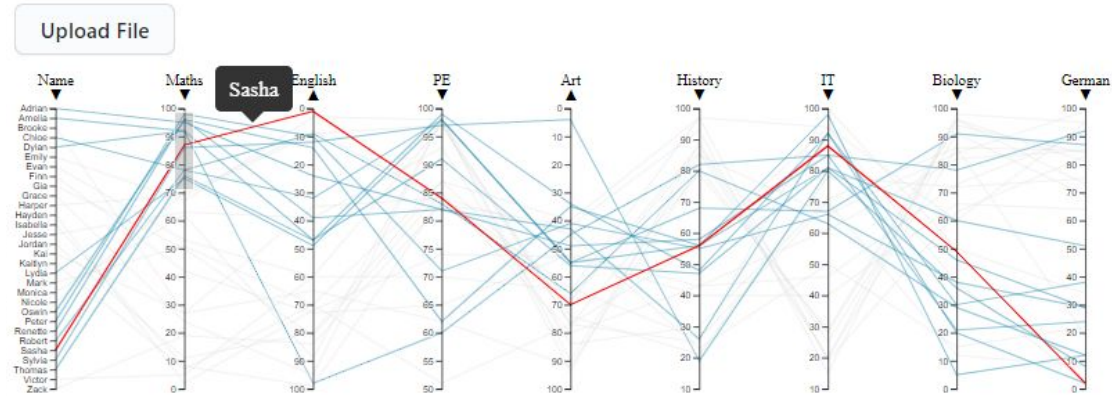- Subjects are assigned 0 to 100 points

Name	Maths	English	PE	Art	History	IT	Biology	German
Adrian	95	24	82	49	58	85	21	24
Amelia	92	98	60	45	82	85	78	92
Brooke	27	35	84	45	23	50	15	22
Chloe	78	9	83	66	80	63	29	12
Dylan	92	47	91	56	47	81	60	51
Emily	67	3	98	77	25	100	50	34
Evan	53	60	97	74	21	78	72	75
Finn	42	73	65	52	43	61	82	85
Gia	50	81	85	80	43	46	73	91
Grace	24	95	98	94	89	25	91	69

Parallel Coordinates Example Implementation

- Technical Details
  - TypeScript library
    - D3.js to create SVG
    - SteerableParcoords to interact with the SVG
  - UI written in HTML and CSS

- UI Elements
  - Upload dataset
  - Feature selection

Demo Video: https://youtu.be/xAgX25kxla8

Outlook

- Finish implementing remaining functions.

- Add SVG printer to properly export plots as vector graphics.

- Implement an explorable explainer using the steerable parallel coordinate library.

- Improve performance for large datasets.

Thank you for your Attention!