Introduction to CSE 4234/5234

Dr. Nasheen Nur

Lecture 1.1 – 01/10/2023

Outline

Introduction to the course

Details of office hours

Textbook

Assignments

- Groups
- Breakdowns

Policies

Introduce yourself

Attendance

How my research work is relevant to this course

Applications/outcomes of this course

Course Instructor: Dr. Nasheen Nur

Welcome to CSE 4234/5234: Web Applications

- I am an Assistant Professor in CES dept. at FIT from Fall 2021
- B.Sc. from **Bangladesh University of Engineering & Technology (BUET)** – 2013
  - Computer Science & Engineering
  - Thesis: Content-based Image Retrieval (CBIR) Using Relevance Feedback.
- Software Engineer & Analyst - April 2013 – June 2015
  - IQVIA Bangladesh
  - ASP .NET Front End Developer (C#, AngularJS, KnockoutJS, SQL)
- Ph.D. @University of North Carolina at Charlotte – Summer 2021
- Data Science Intern - May 2018 – August 2018
  - Pacific Northwest National Laboratory, Seattle
- **Research Interests:** Natural Language Processing ,Network Analytics, Explainable AI, and AI in Education (CS Education)
- **Hobbies**: Sketch, Music, Socializing and researching with/on Neuro Divergent people

Office hours and Syllabus

- We will be using Canvas as the learning management system for this course
  - The course is named as CSE 4234 – will maintain the same course for 5234
- Grader and/TA - TBD
  - He/ she will join within next two weeks
- You will find details information about office hours and syllabus
  - In the “Start here” module
  - Review the syllabus and course objectives
- Office hours
  - 3:00 to 5:00 pm – Wednesdays
  - In person or via zoom
  - Email: nurn@fit.edu
  - Book appointments: calendly.com/nurn
- CS Help Desk in Henry Building
  - https://cs.fit.edu/~pkc/dept/csHelpDesk.html
  - Find the schedule in the link

Required Textbooks / Materials (Mandatory):

- Review the weekly learning guide, class notes, slides, podcasts, and video/ reading materials provided/uploaded by me on canvas.
- Will teach the course focusing on topics sequentially.
- Provide hard and soft copies of topic-wise handouts if needed.
- Lectures will combine multiple books and outside materials (I will provide references with each slide).
- Reference Textbooks (Optional – Not Mandatory):
  - How to Code in Reactjs by Joe Morgan, 2021, ISBN: 978-1-7358317-4-9
  - CSS and HTML Handbooks by Flavio Copes, https://flaviocopes.com/
  - **JavaScript: The Definitive Guide: Master the World's Most-Used Programming Language**
    Book by David Flanagan, 7th Edition

Course Activities

- I will be posting materials 2 weeks ahead of time from next week except the class lectures
- Class lectures will be posted with each week's weekly announcement
- Weekly announcement : Monday or Tuesday early morning
  - I will provide a learning guide for that week
- Each week runs from a Tuesday to next Monday
- Lectures will be recorded, and I will share the videos within 24 hours of the lecture.
- Weekly assignments are due every Tuesday at 11:59 pm

Course Activities: Assignments

- 25% - Prep Quizzes and Exercises
- 50% - Milestone Assignments (Advanced To-Do list)
- 20% - Final Project (Counted as Course Final - will be a final presentation and submission with detailed documentation of the milestone project)
- 3% - Effort [post your questions, exciting findings, and ideas, issues you faced over the week on the weekly open discussion]
- 2% - Attendance

Advanced To-Do List App

Milestones (50%)

- **Milestone 1 -** Website Prototyping with HTML5 and CSS3
- **Milestone 2 -** MVC Application with Routes and Views (React and NodeJS)
- **Milestone 3 -** Session Tracking
- **Milestone 4 -** Database Integration with MongoDB

Final Application (20%) – will be counted as the Final Exam

- Detailed Documentation for code review
- User Manual
- A video presentation
- Some aesthetic improvements to the milestone project

We will build another app throughout the class lectures

- Codes will be provided with the lecture videos so that you can catch up

Attendance Policy and Extra credits

- I will not take attendance everyday
- But….
- We will do a lot of class activities during the class lectures
  - Some class activities (at most 3) will be counted for extra credits(if surprise test) or graded (I will announce if graded)
  - So, inform me if you will be absent and share the approval from Dean's office. I will provide other opportunities to get extra credit

Canvas Demo

Please go over the syllabus

Review the following items

- Academic Honesty Definitions & Procedures
  - Coding exercises and open-ended questions for weekly assignments will be thoroughly checked for plagiarism
- Title IX Statement
- Academic Accommodations
- Covid-19 University Policy

Go over the course and the syllabus for 5-7 minutes now and ask question

Quizzes Due

Syllabus Quiz	Next Tuesday , 17th of January, 11:59 PM
Quiz on the topics for week 1 and 2	24th January, Tuesday, 11:59 PM I will publish the quiz by the end of this week

Topics

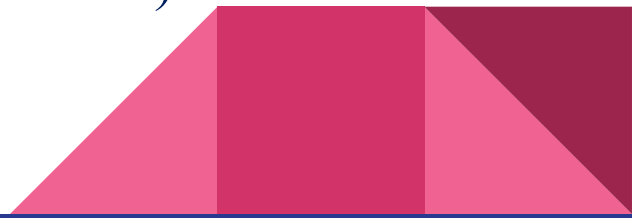
- Internet protocols
- HTML
- CSS
- Vanilla JavaScript
- React and Node JS
- Database Integration - MongoDB
- Advanced Topic: Web Security

Today’s Lecture

- Tomorrow morning (check the announcement)
  - Discord group
  - Learning guide for this week
  - A soft copy of an installment guide for tools
- Let’s introduce ourselves (Attendance)
  - Name
  - Major
  - Your hobbies

Next Lecture:

- Environment Setup
  - Installation of VS code editor
  - Installation of Node JS
  - Installation of Google Chrome
  - Installation of live server in VS code
  - Installation of Emmet in VS code
- How internet works and webpages are rendered
- Concept of Front-end and Backend
  - Client-side Vs Server-side
  - Full-stack and MERN-stack
- Introduction to HyperText Markup Language (HTML)



Course Objectives and Learning Outcomes

- Upon completion of this course, you will be able to:
  - Understand **full-stack** web applications in **MERN** (MongoDB, Express, ReactJS, NodeJS) stack.
  - Build Up basic knowledge on HTML, CSS, and JavaScript.
  - Understand **client-side application** development using **ReactJS** and **JavaScript**.
  - Implement **single page applications** using React JS
  - Build Up functional front-end (client-side) using React JS and CSS framework (Tailwind)
  - Demonstrate an understanding of RESTful API
  - Explain server-side concepts
  - Explain the concepts of **MongoDB database**
  - Build and configure a backend server using Express JS which is a Node JS framework
  - Integrate front-end with backend with the support of MongoDB database
  - Build a RESTful API for the front-end to access backend services using CRUD operations.

Dissertation: EAGER Learning ANALYTCS

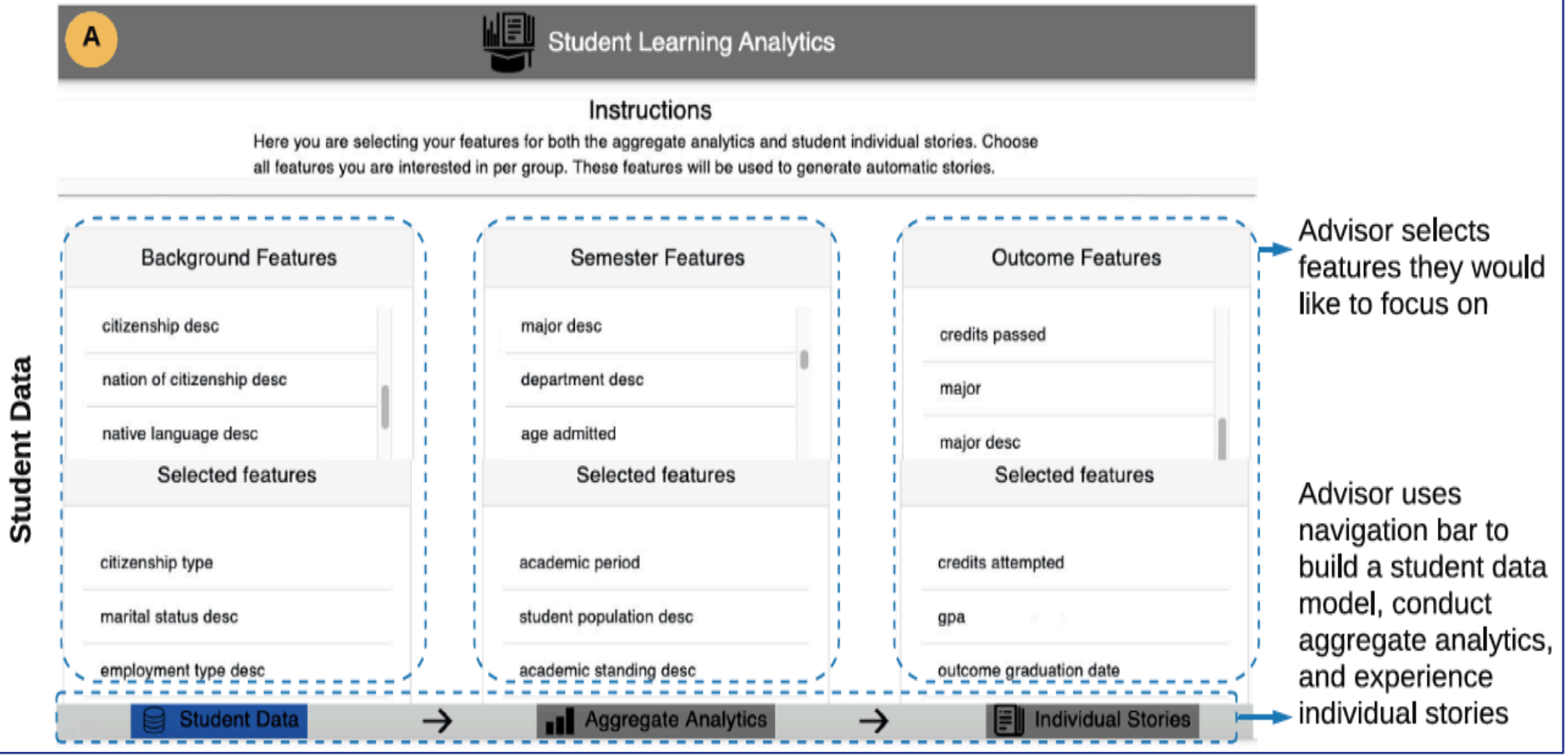
An interactive system to enable academic advisors and program leadership to understand the patterns of behavior related to student success and risk

A Group Effort

- Led the design of the prototype, incorporated analytics, built the student data model and explainable AI segment into the tool
- Funded by NSF
- React JS, Python with MongoDB backend

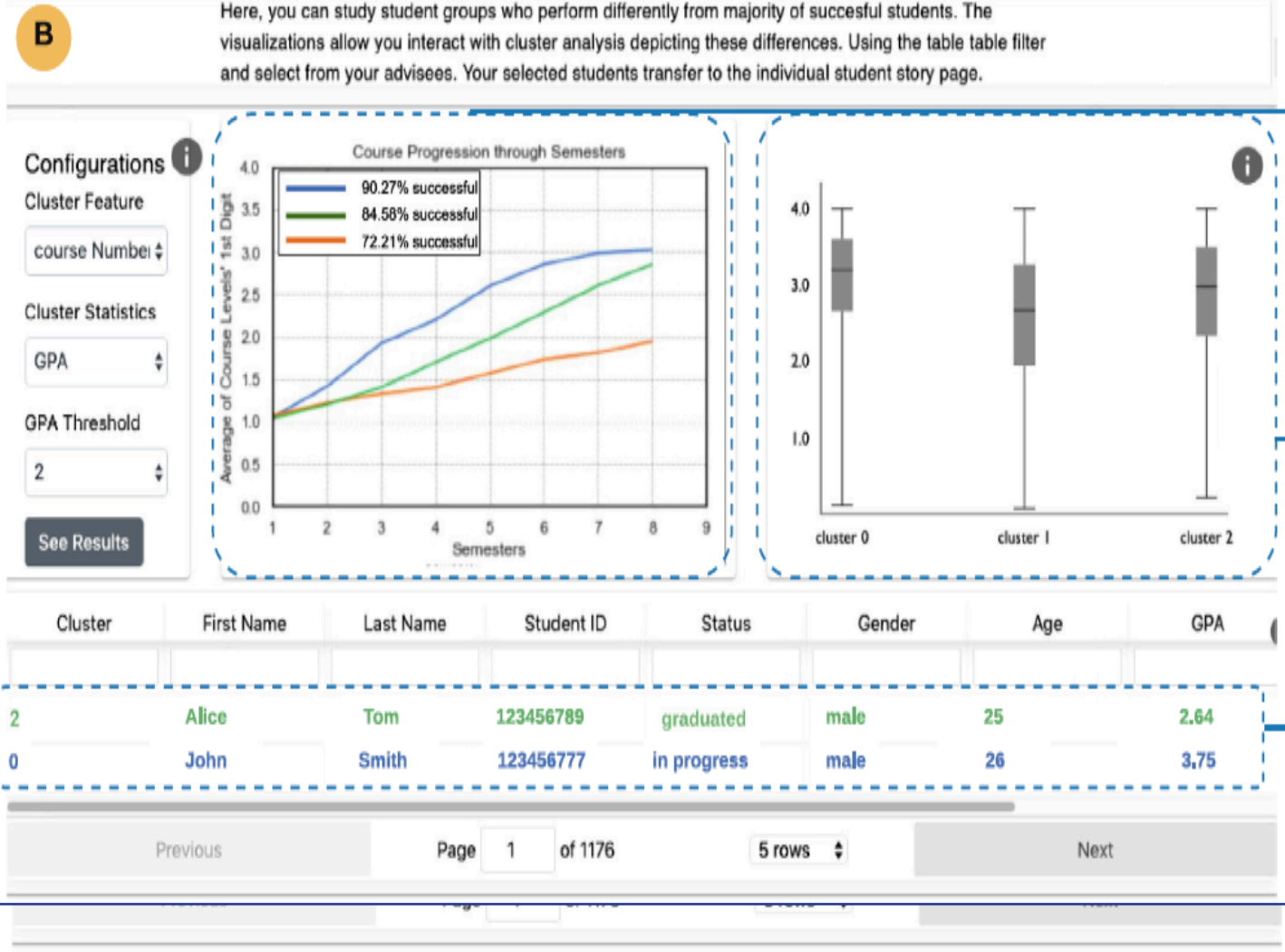
Eager Analytics consists of -

- **Module 01:** Student Data Model
- **Module 02:** Aggregated Analytics
- **Module 03:** Individual Story



Ahmad Al-Doulat, **Nur, Nasheen**, Alireza Karduni, Aileen Benedict, Erfan Al-Hossami, Mary Lou Maher, Wenwen Dou, Mohsen Dorodchi and Xi Niu. "Making Sense of Student Success and Risk through Unsupervised Learning and Interactive Storytelling." In International Conference on Artificial Intelligence in Education, AIED 2020, vol 12163. Springer, Cham, 2020. **[co-authored as first author with equal contribution]**

Aggregate Analytics

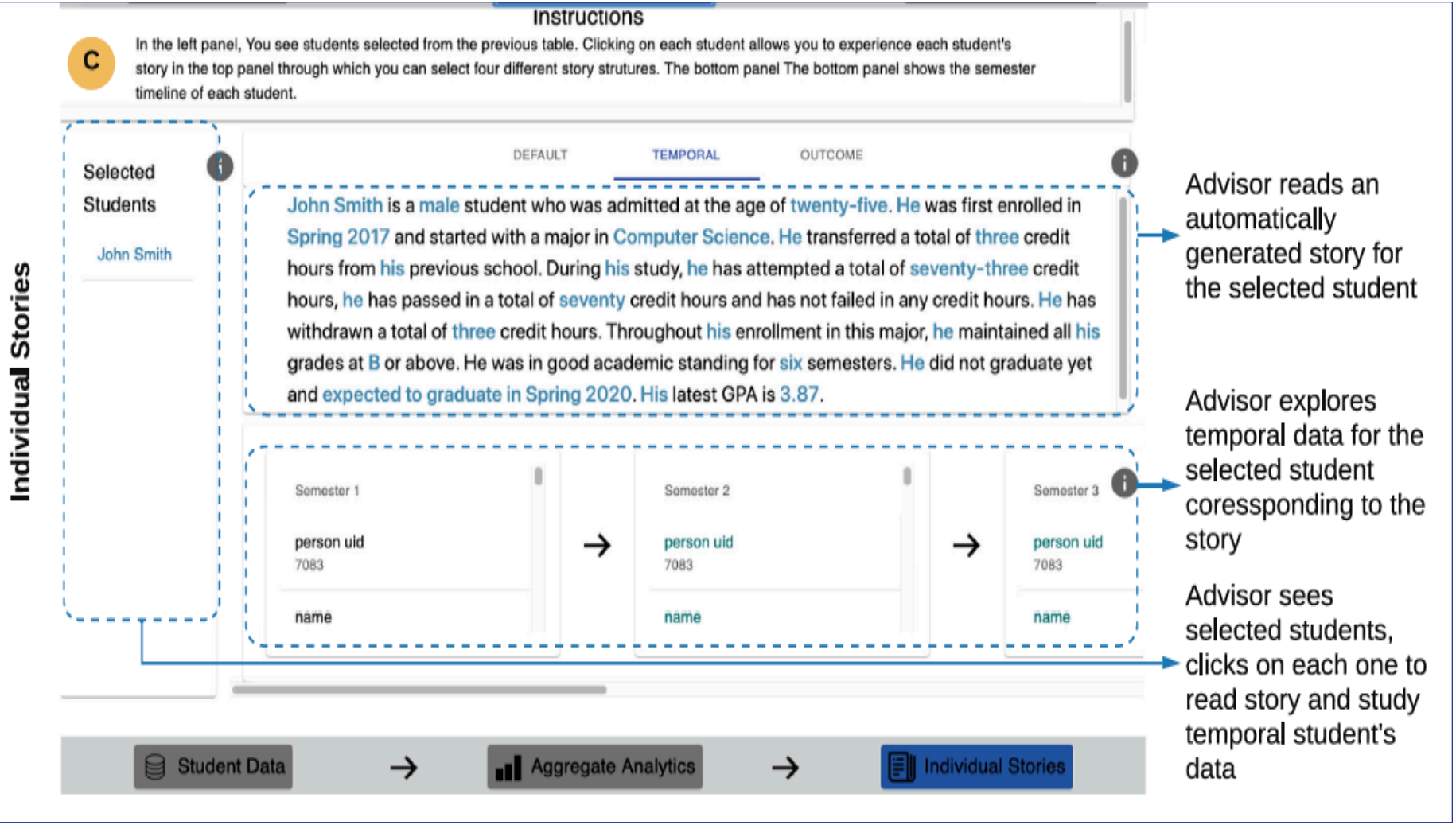


Advisor studies clusters of students based on different temporal features

Advisor studies groups of data averages for different clusters

Advisor searches and selects advisee. The charts in this page will highlight the position of the corresponding student

student


Individual Stories
Instructions
C
In the left panel, You see students selected from the previous table. Clicking on each student allows you to experience each student's story in the top panel through which you can select four different story strutures. The bottom panel The bottom panel shows the semester timeline of each student.
Selected Students
John Smith
DEFAULT
TEMPORAL
OUTCOME
John Smith is a male student who was admitted at the age of twenty-five. He was first enrolled in Spring 2017 and started with a major in Computer Science. He transferred a total of three credit hours from his previous school. During his study, he has attempted a total of seventy-three credit hours, he has passed in a total of seventy credit hours and has not failed in any credit hours. He has withdrawn a total of three credit hours. Throughout his enrollment in this major, he maintained all his grades at B or above. He was in good academic standing for six semesters. He did not graduate yet and expected to graduate in Spring 2020. His latest GPA is 3.87.
Semester 1
person uid
7083
name
Semester 2
person uid
7083
name
Semester 3
person uid
7083
name
Student Data
Aggregate Analytics
Individual Stories
Advisor reads an automatically generated story for the selected student
Advisor explores temporal data for the selected student coressponding to the story
Advisor sees selected students, clicks on each one to read story and study temporal student's data

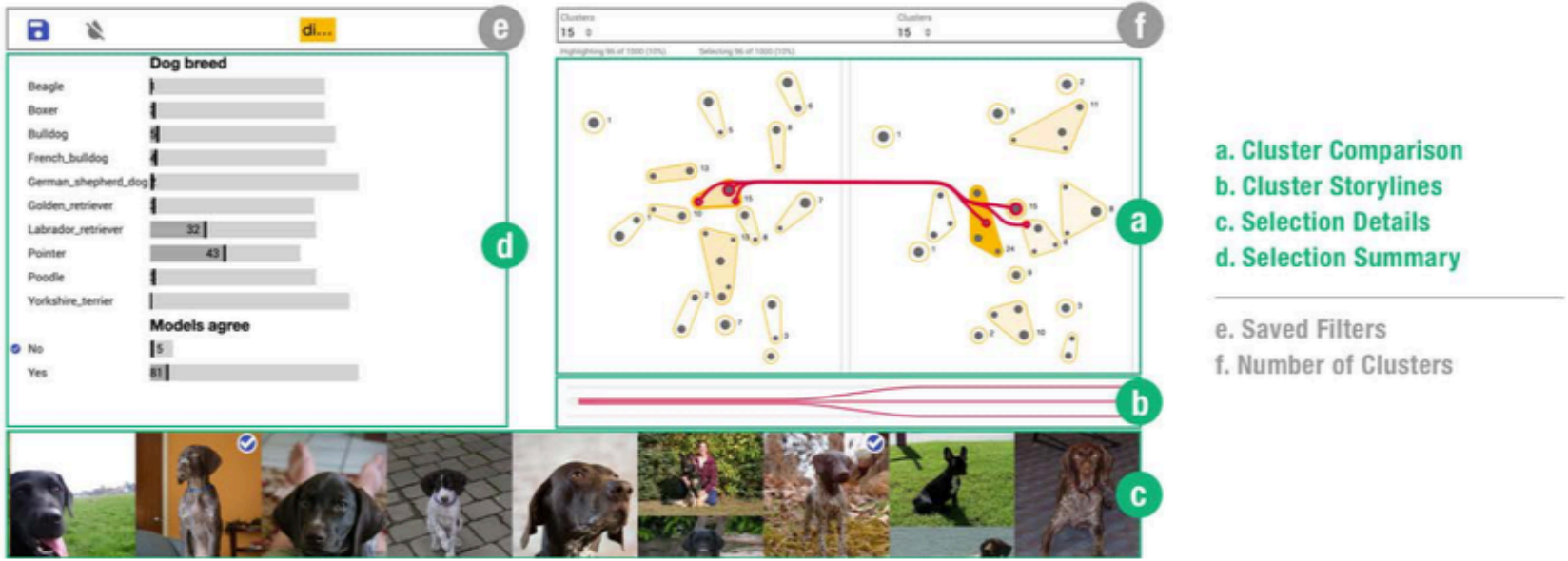


Figure 1: *Parallel Embeddings* has 4 primary views: (a) the "cluster comparison" highlights differences in embeddings of learned representations, (b) the "cluster storylines" overviews the current selection, (c) the "selection details" shows the raw data for the selection, e.g. images, and (d) the "selection summary" shows the distribution of metadata pertaining to the current selection. The user can also (e) save and load filters and (f) change the number of clusters in the cluster comparison view.

Arendt, Dustin, **Nur, Nasheen**, Zhuanyi Huang, Gabriel Fair, Wenwen Dou."Parallel Embedding: A Visualization Technique for Contrasting Learned Representations." In Proceedings of the 25th International Conference on Intelligent User Interface, 2020

Office Hours Tomorrow

From 3:00 to 5:00 pm

Thank you ☺