Temporal Event Sequence Recommendation

A Visual Analytics Approach

Fan Du, Catherine Plaisant, Neil Spring, and Ben Shneiderman



Activities of Similar Archived Students

Having more **Advanced course** events is **positively** correlated to the chance of

of students having

N Advanced Courses

of Advanced Courses

correlation coefficient

becoming a **Acad Postdoc** (ρ=0.64).

Current Record 1. Find Similar Archived Records define the time window for comparison review the similarity score distribution select similar archived records 2. Explore Potential Outcomes review the outcome distributions of all or similar archived records identify important event categories correlated to the desired outcome 3. Review Recommended Actions review the activities of all or similar archived records and those having the desired outcome review the activities that distinguish those who had the desired outcome 4. Review and Tune Plans add events to the action plan review the updated outcome distribution that takes the plan into consideration

Action Plan

EVENTACTION

A prescriptive analytics tool designed to present and explain recommendations of temporal event sequences:

- Identify similar records
- Recommend event sequences that might help achieve the users' goals
- Identify key steps in the recommended event sequences
- Interactively assist users as they define a personalized action plan



Usage Scenarios:

- Consultant exploring alone
- Consultant guiding an advisee
- Advisee making action plans alone

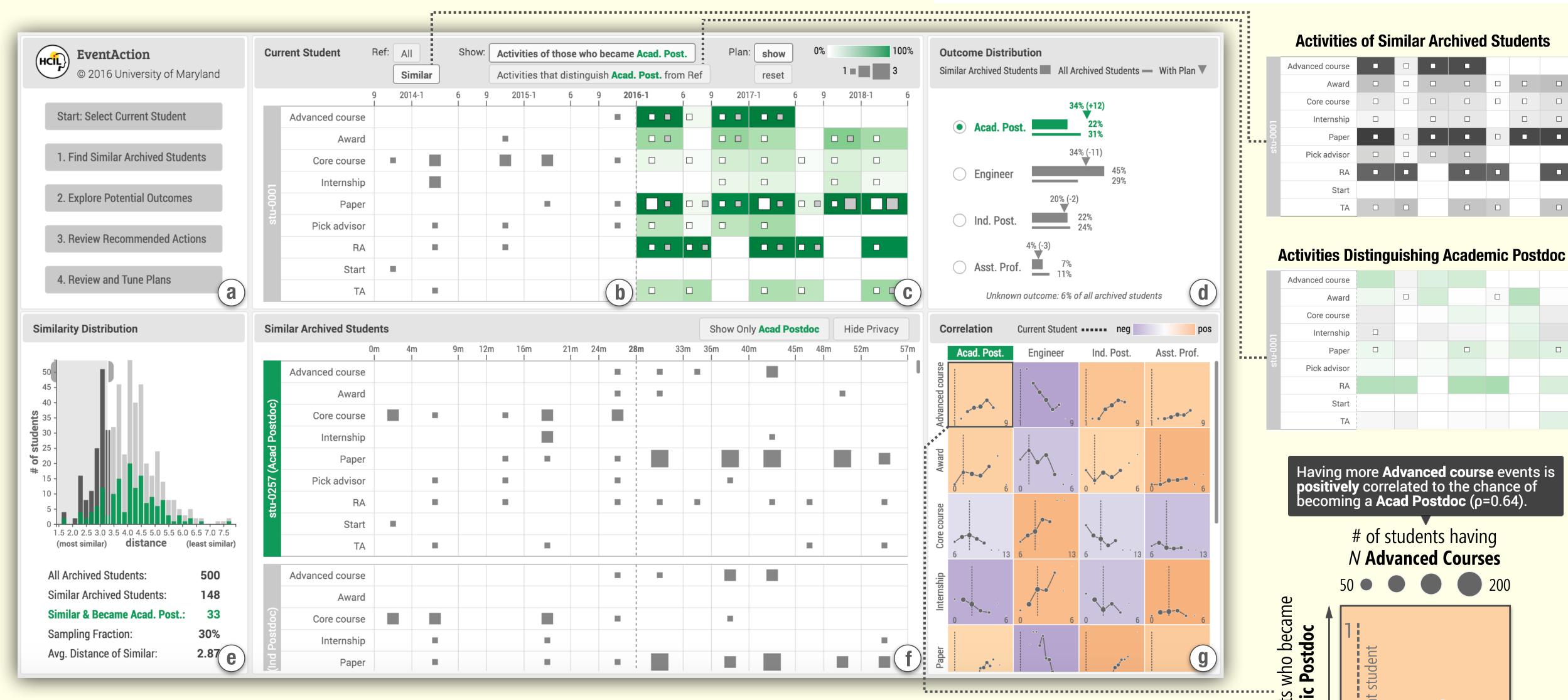


Potential Applications:

- Student advising
- Customer retention
- Medical treatment formulating
- Sports coaching







Interface: the user interface consists of seven coordinated views, opening progressively as the analysis progresses: (a) workflow control panel, (b) current record timeline, (c) activity summary view, (d) outcome distribution view, (e) similarity distribution view, (f) similar archived record timelines, and (g) correlation view.

Case Study: this figure illustrates a synthetic dataset of 500 archived students, including features observed in real data. The recorded event categories are academic activities such as taking courses, winning awards, and publishing papers. The students' first placements are used as possible outcomes, which are categorized into four types, including software engineer, industrial postdoc, academic postdoc, and assistant professor.

Visit hcil.umd.edu/eventaction for more information

Fan Du, Neil Spring, and Ben Shneiderman are with the Department of Computer Science and HCIL, University of Maryland. {fan,nspring,ben}@cs.umd.edu Catherine Plaisant is with UMIACS and HCIL, University of Maryland. plaisant@cs.umd.edu Partial support for this research provided by Adobe



positive (ρ=1)