

HUDK 4051: LEARNING ANALYTICS: PROCESS & THEORY

2/23/17 3:35 PM

First-ever online library of edtech pricing data launches for school districts

The Boston Globe

Wildflower schools bloom amid discontent with education



How Can We Trust Machine Learning?



Technology hijacked sports

AI bests Air Force combat tactics experts in simulated dogfights

Vizio smart TVs tracked viewers around the clock without consent



BBC Local voting figures shed new light on EU referendum

Baseline Use Education to Bring Women Into Data Science
Driving Business Success With Technology

UNIVERSITY of WISCONSIN Superior Online elementary education program recognized by AffordableColleges.com

This is why we publish the World University Rankings



Virginia education officials trying to figure out why 1.5 percent fewer students enrolled in state public, private colleges and universities this academic year



OnlineAthens
ATHENS BANNER-HERALD

State 'school climate' ratings a disservice, says Clarke data analyst

Rep. Swanson files two higher education bills



Microsoft Honors Safer Internet Day with Launch of Digital Citizenship Campaign

Beyond Retention: Colleges Expand Data Analytics to Business and Finance Operations



Top Programming Languages Trends: The Rise of Big Data



How colleges can use Big Data to improve IT operations

The Myth of Immigrants' Educational Attainment
The Atlantic

Those who move to the United States tend to have higher socioeconomic standing in their native countries than what they settle for when they arrive.



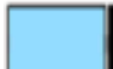













































































The Prestige Gap



KeeWifi

A PERIODIC TABLE OF VISUALIZATION METHODS

<div></div> <div>C</div> <div>continuum</div>	<div><div><div></div><div>Data Visualization Visual representations of quantitative data in schematic form (either with or without axes)</div></div><div><div></div><div>Strategy Visualization The systematic use of complementary visual representations in the analysis, development, formulation, communication, and implementation of strategies in organizations.</div></div></div> <div><div><div></div><div>Information Visualization The use of interactive visual representations of data to amplify cognition. This means that the data is transformed into an image, it is mapped to screen space. The image can be changed by users as they proceed working with it</div></div><div><div></div><div>Metaphor Visualization Visual Metaphors position information graphically to organize and structure information. They also convey an insight about the represented information through the key characteristics of the metaphor that is employed</div></div></div> <div><div><div></div><div>Concept Visualization Methods to elaborate (mostly) qualitative concepts, ideas, plans, and analyses.</div></div><div><div></div><div>Compound Visualization The complementary use of different graphic representation formats in one single schema or frame</div></div></div>																<div></div> <div>G</div> <div>graphic facilitation</div>
<div></div> <div>Tb</div> <div>table</div>	<div></div> <div>Ga</div> <div>cartesian coordinates</div>	<div><div></div><div>Me</div><div>meeting trace</div></div> <div><div></div><div>Mm</div><div>metro map</div></div> <div><div></div><div>Tm</div><div>temple</div></div> <div><div></div><div>St</div><div>story template</div></div> <div><div></div><div>Tr</div><div>tree</div></div> <div><div></div><div>Ct</div><div>cartoon</div></div>															
<div></div> <div>Pi</div> <div>pie chart</div>	<div></div> <div>L</div> <div>line chart</div>	<div><div></div><div>Co</div><div>communication diagram</div></div> <div><div></div><div>Fp</div><div>flight plan</div></div> <div><div></div><div>Cs</div><div>concept skeleton</div></div> <div><div></div><div>Br</div><div>bridge</div></div> <div><div></div><div>Fu</div><div>funnel</div></div> <div><div></div><div>Ri</div><div>rich picture</div></div>															
<div></div> <div>B</div> <div>bar chart</div>	<div></div> <div>Ac</div> <div>area chart</div>	<div></div> <div>R</div> <div>radar chart cobweb</div>	<div></div> <div>Pa</div> <div>parallel coordinates</div>	<div></div> <div>Hy</div> <div>hyperbolic tree</div>	<div></div> <div>Cy</div> <div>cycle diagram</div>	<div></div> <div>T</div> <div>timeline</div>	<div></div> <div>Ve</div> <div>venn diagram</div>	<div></div> <div>Mi</div> <div>mindmap</div>	<div></div> <div>Sq</div> <div>square of opposition</div>	<div></div> <div>Cc</div> <div>concentric circles</div>	<div></div> <div>Ar</div> <div>argument slide</div>	<div></div> <div>Sw</div> <div>swim lane diagram</div>	<div></div> <div>Gc</div> <div>gantt chart</div>	<div></div> <div>Pm</div> <div>perspectives diagram</div>	<div></div> <div>D</div> <div>dilemma diagram</div>	<div></div> <div>Pr</div> <div>parameter ruler</div>	<div></div> <div>Kn</div> <div>knowledge map</div>
<div></div> <div>Hi</div> <div>histogram</div>	<div></div> <div>Sc</div> <div>scatterplot</div>	<div></div> <div>Sa</div> <div>sankey diagram</div>	<div></div> <div>In</div> <div>information lens</div>	<div></div> <div>E</div> <div>entity relationship diagram</div>	<div></div> <div>Pt</div> <div>petri net</div>	<div></div> <div>Fl</div> <div>flow chart</div>	<div></div> <div>Cl</div> <div>clustering</div>	<div></div> <div>Lc</div> <div>layer chart</div>	<div></div> <div>Py</div> <div>minto pyramid technique</div>	<div></div> <div>Ce</div> <div>cause-effect chains</div>	<div></div> <div>Tl</div> <div>tulmin map</div>	<div></div> <div>Dt</div> <div>decision tree</div>	<div></div> <div>Cp</div> <div>cpm critical path method</div>	<div></div> <div>Cf</div> <div>concept lan</div>	<div></div> <div>Co</div> <div>concept map</div>	<div></div> <div>Ic</div> <div>iceberg</div>	<div></div> <div>Lm</div> <div>learning map</div>
<div></div> <div>Tk</div> <div>tukey box plot</div>	<div></div> <div>Sp</div> <div>spectrogram</div>	<div></div> <div>Da</div> <div>data map</div>	<div></div> <div>Tp</div> <div>treemap</div>	<div></div> <div>Cn</div> <div>cone tree</div>	<div></div> <div>Sy</div> <div>system dyn./ simulation</div>	<div></div> <div>Df</div> <div>data flow diagram</div>	<div></div> <div>Se</div> <div>semantic network</div>	<div></div> <div>So</div> <div>soft system modeling</div>	<div></div> <div>Sn</div> <div>synergy map</div>	<div></div> <div>Fo</div> <div>force field diagram</div>	<div></div> <div>Ib</div> <div>ibis argumentation map</div>	<div></div> <div>Pr</div> <div>process event chains</div>	<div></div> <div>Pe</div> <div>pert chart</div>	<div></div> <div>Ev</div> <div>evocative knowledge map</div>	<div></div> <div>V</div> <div>vee diagram</div>	<div></div> <div>Hh</div> <div>heaven 's' hell chart</div>	<div></div> <div>I</div> <div>informal</div>

http://www.visual-literacy.org/periodic_table/periodic_table.html

Opportunities

- Application Deadline: Feb 24, 2017 Curriculum Associates Psychometric and Research Summer 2017 Internship (see attached)
- Application Deadline May 2, 2017: Simon Initiative's LearnLab Summer School (<http://learnlab.org/index.php/simon-initiative-summer-school/>)
- Mar 4, 2017 BetaNYC School of Data (<https://schoolofdata.nyc/>)
- Mar 7, 2017, Boston, AnalyticsFair (<http://analyticsfair.com>, FREE for Jobseekers and Early Startups)
- Feb 24, 2017 DataKind Giving-Tuesday Prep-Course (<https://www.eventbrite.com/e/givingtuesday-datadive-pre-event-prep-course-with-metis-tickets-31640075317>)

Podcast

- Last week: SC: 19, LP: 2, TW: 2

Natural Language Processing

NLP

Analyses of language produced by humans (by computers)

- Treats language as a varied pool of information sources
- In order to:
 - Understand language (Cognitive Science)
 - Respond to the speaker appropriately (AI)
- Examples
 - Translation
 - Automated feedback (education, shopping)
 - Study linguistics, cognition, development, etc.

Methodological History

1930s

————— - - - - - ➔
Understanding

Rule based

- Complex sets of rules (grammar/syntax)
- Chomsky



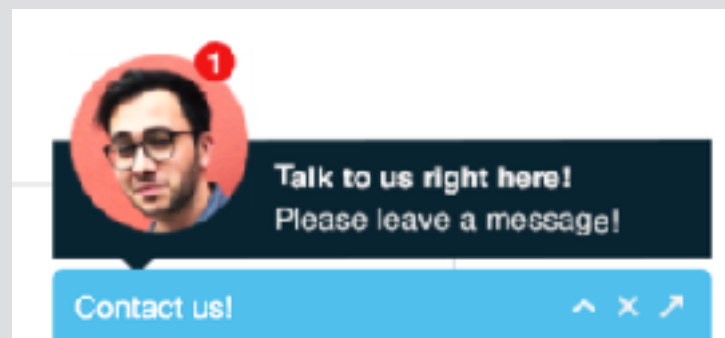
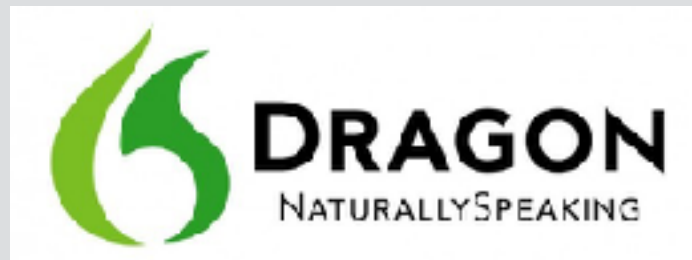
1980s

————— ➔
Processing

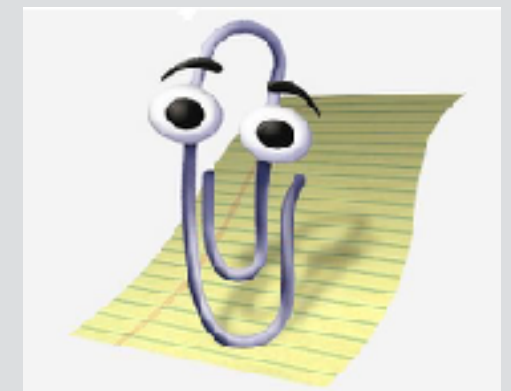
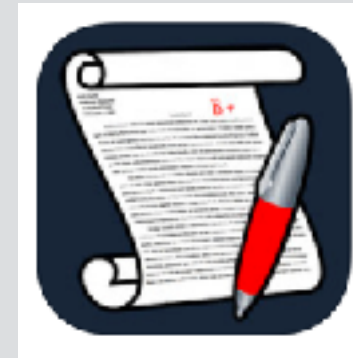
Statistical

- Infer rules from data
- IBM

Industry



Education

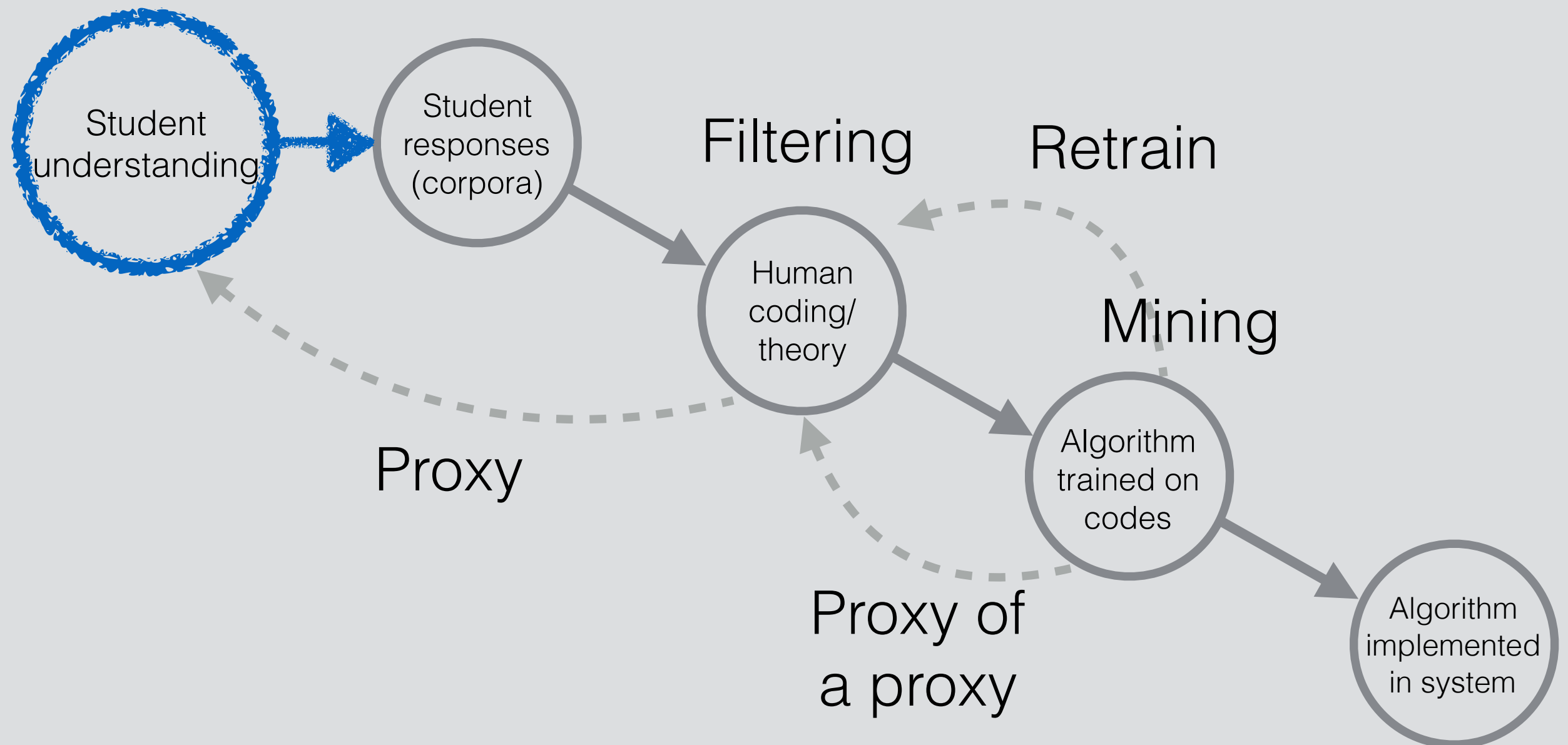


Essential Problem

- Heterogeneity
- We get rid of this by asking MCQ questions - but we also throw out a lot of information when we do that
- Collect more data and more complex data through written answers

Overall Method

Latent trait



Coding

Word counting



Google books Ngram Viewer

Types of Expressions

“I don’t know...”

“I dunno...”

Stemming

Take the root of the word:
educate, education, educating

Tokenization (bag of words)

Chopping word/phrase into
tokens

- Remove punctuation
- Find best number of letters to represent a word/meaning
- Consider all possible versions of word
- Stop word removal



Features

Algorithms

Feature selection

- Not all tokens are useful, which ones can we scrap?

Feature extraction

- Extracting features from combining tokens