Humboldt-Universität zu Berlin

Department of Informatics

Computer Science Education / Computer Science and Society

Seminar „Educational Data Mining“

Organisation

- **Place:** RUD 25, 3.101
- **Date: Wednesdays**, 15:15 – 16:45 Uhr
- **Seminar assessment criteria:**
  - 30min. talk + 15min. Discussion
  - Slides giving 1 week before the talk via email (if you like)
  - Attendance at classmates' presentations
  - Active participation in discussions
  - Paper (approx. 10 pages including references)
- **Website/additional information:**
  - http://cses.informatik.hu-berlin.de/
  - For Students -> Teaching -> SS2016 -> Educational Data Mining
  - See also: topics for thesis in the field of intelligent learning systems https://cses.informatik.hu-berlin.de/for_students/thesis.php

Seminar dates – schedule (1)

KW16 (20.04.): Introduction, presentation of topics

KW17 (27.04.): *free* (final assignment of topics)

KW18 (04.05.): *free*

KW19 (11.05.): *free*

KW20 (18.05.): *free*

KW21 (25.05.): Talk 1 and 2

KW22 (01.06.): Talk 3 and 4

Seminar dates – schedule (2)

KW23 (08.06.): Talk 5 and 6

KW24 (15.06.): Talk 7 and 8

KW25 (22.06.): Talk 9

KW26 (25.06.): *free*

KW27 (02.07.): Buffer

…

KW39 (30.09.): Paper Due

Introduction to EDM

- What is Educational Data Mining (EDM)?

– Educational Data Mining is an emerging discipline, concerned with developing methods for exploring the unique types of data that come from educational settings, and using those methods to better understand students, and the settings which they learn in.

>>>http://www.educationaldatamining.org/

International Educational Data Mining Society

EDM Methods

- Prediction
- Clustering
- Relationship mining
- Discovery with models
- Distillation of data for human judgment
- ...

Who & What can EDM help?

- Students/learners
  - Hint generation (Barnes, T. et.al 2008)
  - Personalized courseware recommendation (Chen, C. et al. 2004)
  - Recommend learning partners (Huang, Jeff JS et al. 2010)
  - …

Who & What can EDM help?

- Teachers/instructors
  - Detect gaming system (Ryan Baker)
  - Predict motivation level (Mihaela Cocea et al. 2006)
  - Assess learners' performance (Chih-Ming Chen et al. 2009)
  - …

Who & What can EDM help?

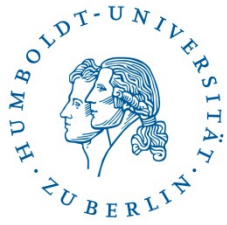
- Administrators/policy makers
  - The impact of curriculum revisions (Becker, K. et al. 2000)
  - Course Planning of extension education (Hsia, T. et al. 2008)
  - Select students for remedial classes (Ma, Y. et al. 2000)
  - …

About us

- Zhilin Zheng
  - Predict MOOCs' drop out (EMNLP 2014)
  - Students' performance prediction (EDM 2016)
  - 100 percenters (EDM 2016)
  - Learning groups re-composition (PhD dissertation TBA)

- Sebastian Groß
  - DynaFIT project
  - Research in the field of Intelligent Tutoring Systems (ITS) focusing on (dynamic) feedback strategies
  - Using machine learning techniques to structure solution spaces and to analyze learners' activities
  - FIT Java Tutor (ITS for learning Java programming)

Topics

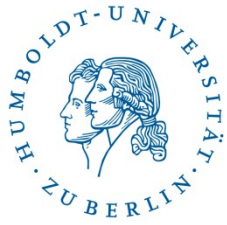


- **Introduction to Educational Data Mining**
  - What is Educational Data Mining?
  - What are typical data mining techniques and what are their goals?
  - How can these techniques be used to enhance learning?
- **Online Discussion**
  - How to faciliate online discussion?
  - What are the popular text ming techonologies?
  - What insights gained from the online discussion so far?
  - What are the future issues?

Topics

- **Clustering**
  - What is Clustering and how does it work?
  - What is Spectral Clustering and what is its purpose?
  - What is model-based clustering?
  - What are drawbacks of the K-Means clustering?
  - Are there other clustering methods and for what can they be used?
- **Students‘ Engagement at MOOC**
  - What factors would exert influence on the students‘ engagement ?
  - How to address the high drop-out rate problem?
- **Learning Behaviors Mining**
  - How to mine learning behaviors?
  - What are difficulties of the current mining technoloigies?
  - Is it possible to predict the learning outcomes using the extracted learning behavior patterns?

Topics



- **Social Network Analysis**
  - What are challeneges of Social Network Analysis methods in Educational Data Mining?
  - What are goals of Social Network Analysis and how to achieve?
- **Swarm Intelligence**
  - What is Swarm Intelligence?
  - What are typical algorithms and applications related to learning?
  - What are pros/cons of Swarm Intelligence?
- **Analysis of Student/Student- and Student/Tutor-Interactions**
  - How can computer-based interactions between students (and teachers) be identified?
  - How can such analysis lead to clearer understanding and improvements in learning?

Topics

- **Affect Detection**

Last minute

Don’t limit your reading only to our recommendation list! We are always looking forward to something new you share with us.


ANY
QUESTIONS
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