

S504 Advanced Topics in Data Mining Techniques

Fall 2007, Instructor: Dr. Milos Manic

<http://husky.if.uidaho.edu/ee578s07/>

Class description

Course outline:

Course title: CS504 Advanced Topics in Data Mining Techniques (3 cr)

Topics: This is an advanced topics course in Data Mining or Knowledge Discovery from Data (KDD) Systems. The course will develop a theoretical framework for major issues in data mining. Data preprocessing, reduction, data warehouse to data mining, mining frequent patterns, associations, and correlations, classification and prediction, cluster analysis, and mining stream, time-series, and sequence data mining, Bayesian classification, decision tree induction, classification by backpropagation and support vector machines, will be emphasized through optimization techniques, aspects of fuzzy logic and neural networks.

Because of the multifaceted nature of the course, only undergraduate seniors with mathematical and system maturity will be permitted to take this graduate course. Mastery of the theoretical foundations will be tested but the major goal of this course is the design and implementation of a advanced data mining system with expectations of optimal performance and flexibility. Prereq: Graduate standing or instructor permission.

This course was offered for the first time at the University of Idaho.

To be offered: Fall 2007 in Idaho Falls (live) and via WebCT (outside of Idaho Falls).

Credits: 3 credit course

Schedule (tentative):

Tuesday and Thursday, 12:00pm - 01:15pm mdt

Office (tentative):

hours Tuesday and Thursday, 11:00am - 12:00pm mdt (please make an appointment)

Location:

Live in Idaho Falls (CHE 307), web based course (WebCT) outside.

Instructor:

Milos Manic, Ph.D.
University of Idaho
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url: <http://www.cs.uidaho.edu/people.html>

url: <http://husky.if.uidaho.edu>

Class web page:

<http://www.husky.if.uidaho.edu/DMf07/>

WebCT url: please refer to course url above.

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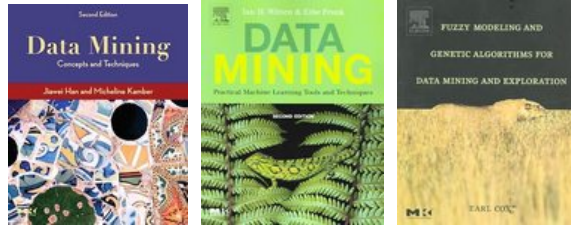
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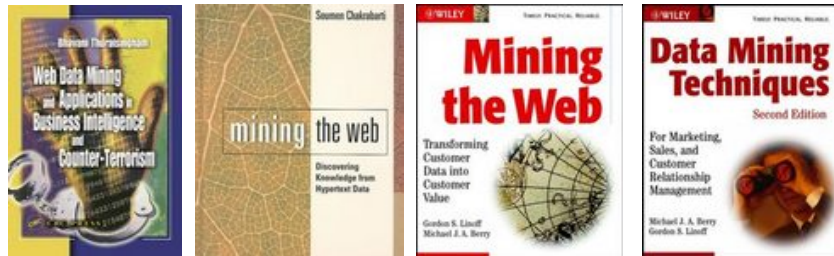
Textbooks:

Required textbooks include:



- Data Mining: Concepts and Techniques, Jiawei Han, Micheline Kamber, Hardcover: 770 pages, Publisher: Elsevier Science Ltd (The Morgan Kaufmann Series in Data Management Systems); 2nd edition (Apr 2006), ISBN-10: 1558609016, ISBN-13: 9781558609013 links 1 2
- Fuzzy Modeling and Genetic Algorithms For Data Mining and Exploration, Earl Cox, Dec 2004, Format: Paperback: 530 pages, Publisher: Elsevier Science Ltd (The Morgan Kaufmann Series in Data Management Systems), ISBN-10: 0121942759, ISBN-13: 9780121942755
- Data Mining: Practical Machine Learning Tools and Techniques, Ian H. Witten, Eibe Frank, Paperback: 525 pages, 2 edition (June 10, 2005), Publisher: Morgan Kaufmann (Morgan Kaufmann Series in Data Management Systems); ISBN-10: 0120884070, ISBN-13: 978-0120884070.

Recommended textbooks (related more towards applications) include:



- Web Data Mining and Applications in Business Intelligence and Counter-Terrorism, Bhavani Thuraisingham, ISBN-10: 0849314607, ISBN-13: 9780849314605, Hardcover, June 2003, CRC Press.
- Mining the Web: Discovering Knowledge from Hypertext Data, Soumen Chakrabarti, Hardcover, ISBN-10: 1558607544, ISBN-13: 9781558607545, 2002, Morgan Kaufmann Pub.
- Mining the Web: Transforming Customer Data into Customer Value, Author: Gordon Linoff, Michael J. A. Berry, Format: Paperback: 348 pages, Feb 2002, Publisher: John Wiley & Sons Inc, ISBN-10: 0471416096, ISBN-13: 9780471416098
- Data Mining Techniques: For Marketing, Sales, and Customer Relationship Management, Author: Berry, Gordon S. Linoff, Format: Paperback, 648 pages, Edition: 2 (Apr 2004), Publisher: John Wiley & Sons Inc, ISBN-10: 0471470643, ISBN-13: 9780471470649

Required material will be provided through handouts and web based documentation. Also, there is a variety of recommended text books listed at course web page.

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- Helpful prerequisites by topics:** Graduate standing or instructor permission.
- Grading system:** Two exams, team project and report, in class presentations, and homework assignments.
- Goal of this course:** This course provides graduates and seniors with the theoretical and practical tools for designing, simulating and implementing data mining systems. Course equips students with tools to attack basic research and application oriented problems in data mining.
- Major topics:**
- ✚ Data mining and exploration, practical machine learning techniques, data warehousing, and modern heuristics with applications in:
 - Web Data Mining (Discovering Knowledge from Hypertext Data, Data Webhousing)
 - Business Intelligence (Marketing, Sales, and Customer Relationship Management)
 - Counter-Terrorism
- Detailed list of topics:** ✚ Please refer to class web page <http://www.husky.if.uidaho.edu/DMf07/>
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- Assigned projects:** ✚ Please refer to class web page <http://www.husky.if.uidaho.edu/DMf07/>
(equipment used – PC computer with simulation software)
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