Applications and Business Models of Data Science and Artificial Intelligence

Class Time: Tuesday and Thursday 2:30 PM - 5:30 PM
Course Instructor: Farnoosh Forouzandeh
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COURSE CATALOG DESCRIPTION:

In today’s business world, data is one of the most vital assets of any organization or business, and knowing how to manage, analyze, and glean insights from data sets is essential to making forward-looking and effective decisions. As a result, databases in which data is quality, protected, yet easily accessible and understandable have become the core of companies’ intellectual infrastructures.

Similarly, data is essential to the functioning of artificial intelligence and machine learning. This course will provide a practical foundation in data science and artificial intelligence through the lens of industry examples. Students, both technical and non-technical, will gain a better general understanding of the facets of AI, its business applications today and in the future, its ethical and societal impacts, and how both data science and AI can be applied to students’ future careers.

In this course you will learn how to design a database and model the business. Using native programming language of database (SQL) to interact with database, access data and manipulate them. Also you will understand what is BI and data visualization by working with one the popular software called Tableau. Then you will learn about different aspects of AI and how companies using AI these days.

COURSE OBJECTIVES:

- To gain an understanding of data and data modeling
- To gain an understanding of Relational Database Management Systems.
- To gain an understand and use Structured Query Language.
- To gain an understanding of Data Analytics and Visualization.
- To gain an understanding of all the facets of Artificial Intelligence (AI) technology
- To gain an understanding of the business applications of AI today
- To gain an understanding of the business applications of AI in the future
- To gain an understanding of ways in which your career and skills may relate to AI

Sessions are a combination of theoretical lecture and practice with software and guest speakers’ presentations. Also, by the end of each week you will have some course works. There are some test and quizzes during the course. There is a final project that should be presented on last week of the course along with a report.
FINAL PROJECT:

The students will have to choose a dataset of their own and build at least five Tableau dashboards for management level to help make better and faster decisions. Then students will suggest how they can apply AI/ML, based on one or more topics in this course, to improve a company, product, service, career or organization.

The students will present their work in the class, the format of the presentation will be a slide presentation. In addition to that, students will submit five pages’ report based on their presentation. Please ensure that cite all of your references on your final report.

The deadline for submitting the report is Aug 1st.

COURSE MATERIAL:

Handouts: To be assigned during class
Presentations: To be assigned during class

OPTIONAL COURSE TEXT(S):

Storytelling with Data: A Data Visualization Guide for Business Professionals
Author(s): Cole Nussbaumer Knaflic
Publisher: Wiley (November 2, 2015)

Data Science for Business: What You Need to Know about Data Mining and Data-Analytic Thinking
Author(s): Foster Provost, Tom Fawcett
Publisher: O'Reilly Media (August 19, 2013)

The Master Algorithm: How the Quest for the Ultimate Learning Machine Will Remake Our World
Author(s): Pedro Domingos
Publisher: Basic Books; 1 edition (February 13, 2018)

Superintelligence: Paths, Dangers, Strategies
Author(s): Nick Bostrom
Publisher: Oxford University Press; Reprint edition (May 1, 2016)

Our Final Invention: Artificial Intelligence and the End of the Human Era
Author(s): James Barrat
Publisher: St. Martin's Griffin; Reprint edition (February 17, 2015)
SOFTWARE:
MySQL, Navicat
Tableau Desktop

GRADING:
Class participation 10%
Quiz/Test/Assignments 30%
Project 60% (Presentation and report)
Total 100%

THE GRADING SCALE:
A: 900 – 1000
B: 800 - 899
C: 700 – 799
D: 600 - 699
F: 599 and below

COURSE OUTLINE (Tentative):

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<tr>
<th>Week</th>
<th>Subject</th>
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<tr>
<td><strong>Week 1</strong></td>
<td>Tue 06/23</td>
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<tr>
<td></td>
<td>• Intro to data science, AI and machine learning</td>
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<td>Thurs 06/25</td>
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<td></td>
<td>• What is DB and DBMS?</td>
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<td>• History of DB</td>
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<td>• Data modeling (Entity relationship, Keys, data type)</td>
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<td><strong>Week 2</strong></td>
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<td>• Quiz</td>
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<td>• Intro to SQL Query</td>
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<td>• SQL programming - basic</td>
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<td>• SQL programming Hands-on</td>
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<td>Thurs 07/02</td>
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<td>• SQL programming - advanced</td>
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<td>• SQL programming Hands-on</td>
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<td><strong>Week 3</strong></td>
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<td>• Intro to data analysis and visualization</td>
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<td>• Intro to Tableau</td>
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<td>• Tableau Hands-on</td>
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<td>Thurs 07/09</td>
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<td>• Tableau - advanced</td>
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<td>• Tableau Hands-on</td>
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| **Week 4** | Tue 07/14  | • SQL Quiz  
            • Tableau Hands-on                                                      |
|        | Thurs 07/16| • SQL quiz Q&A  
            • Machine learning vs. Big data  
            • Different types of Machine learning  
            • *Guest Speakers: TBD*             |
| **Week 5** | Tue 07/21  | • Natural language processing(NLP)  
            • Chatbots  
            • *Guest Speaker: TBD*             |
|        | Thurs 07/23| • SQL Quiz  
            • Robotics  
            • Computer Vision and image processing  
            • *Guest Speaker: TBD*             |
| **Week 6** | Tue 07/28, | • Final Project Presentations                                                |
|        | Thurs 07/30|                                                             |