Course Description

‘Data and analytics’ are driving industries transformation. Accelerated pace of digitization, increasing number of connected objects, and immense progress in cloud and data technologies are among its main drivers.

In ‘Technological Revolutions and Innovations’ course we shall present and analyze this data-driven revolution. The course brings examples from various industries, with special emphasis on Financial Services (FinTech).

The course is split into three parts:
The first one presents an overview of the data-driven revolution and models for analyzing it. We'll show the emergence of new business models like trading 'data' for 'services', present the concept of 'data economy' and discuss the 'data network effect'.

The second part will be dedicated to 'use cases' mainly from the Financial Sector. We'll start by describing the underlying business opportunities and threats driving change. We'll then demonstrate how data and analytics are leveraged to exploit opportunities and address threats. This part of the course will include 'hands on' analysis of data using different techniques like decision trees, recommender systems, and more.

In the last part, we'll discuss challenges, risks and threats arising from AI adoption like privacy, ethics, technology and social impacts.

Course Goals

- Exposed to the potential of 'Data and analytics' to transform the world, by 'hands on' identifying, analyzing and exploiting business opportunities of leveraging data.
- Made aware to the challenges, risks and threats of 'Data and analytics' transformation.
- Introduced to the Financial Sector Tech-lead business transformation via the choice of use cases presented.

Grading

Assignments and Requirements:

- Attendance (according to IDC regulations) and class participation.
- Individual assignments.
- Team assignments and presentations.

Composition of Course Grade:

- Team case study 30%
- Individual exercise #1 20%
- Individual exercise #2 20%
- Final exam 30%

Students who demonstrate active participation in 10 or more classes and received a minimum of 60 on their final assignment will receive 2 bonus points.

Assignment Submissions:
• All submissions MUST be submitted through class Moodle.
• Unjustified late submissions will result in a “0” grade.

**Course Assignments**

**Detailed assignment guidelines will be uploaded separately to Moodle**

**Individual assignments:** (70%)

Exercise #1 – recommender systems – Grading 20%
Due: Apr 3rd, 2022

Exercise #1 – pricing – Grading 20%
Due: May 1st, 2022

**Team Assignments:** (30%)

Case Study: Cases will be prepared and submitted in teams of 4-5.
The class will be divided into 3 groups (randomly).
Each team will present and submit a single case study.

Due:
Case Study 1 Week 7, April 24th, 2022
Case Study 2 Week 9, May 8th, 2022
Case Study 3 Week 11, May 22nd, 2022

2. **Final Exam** – Total grading 30%

Examples will be provided

Due: See exam schedule

**To pass the course**

• Attend and take active part in case studies sessions. Failing to attend these classes without notice will deduce 5 points in grade.
• Students who demonstrate active participation in 10 or more classes and received a minimum of 60 on their final assignment will receive 3 bonus points
• Students who cannot attend class presentations should send an email in advance to class TA/Instructor /faculty administration with evidence supporting their claim.
• Both exam and overall grade above 60
Lecturer Office Hours

Following class

Teaching Assistant

Omri Melamed

Additional Notes

Executive manager, entrepreneur and lecturer with vast experience leading tech ventures. To date, I’m the founder and CEO of Topicx, a startup developing a revolutionary conversational-AI platform for qualitative market research at scale.

My career was focused on FinTech, I was the Chief Digital & Innovation Officer of Surecomp, a leading FinTech providing trade finance solutions.

Prior to that, I established and headed Citigroup Technology Innovation Lab in Israel (+200 developers) specializing in data & analytics. As part of the lab, I initiated in Israel, Citi’s first acceleration program globally. The tens of startups joining the program since inception, raised so far close to $1B.

I started my career at SuperDerivatives (sold to ICE for $350M), a global leader in derivatives technology and analytics where I eventually led R&D.

Reading List

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<th>Date</th>
<th>Content / Topic</th>
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<th>Course Materials</th>
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<tbody>
<tr>
<td>1</td>
<td>Feb 27th</td>
<td>“Data is giving rise to a new Economy”</td>
<td>Lecture</td>
<td>The Economist, (2017), “Fuel of the future, Data is giving rise to a new economy, How is it shaping up?”</td>
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<td>Citi GPS (2017) “Digital Disruption –</td>
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<td>Revisited* p. 30-33</td>
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| 2 | Mar 6th    | FinTechs leveraging Data & Analytics reshaping Financial Services | Lecture  
Citi GPS (2018), "Bank X" p. 41-43, 73-75, 83-86  
FSB (2017), "Artificial intelligence and machine learning in financial services" Ch 3 p. 9-23  
CB Insight (2018), "Financial services & the deep learning revolution" |
| 4 | Mar 20th   | “Surprise and delight your customers by going beyond their expectations” | Lecture +  
Machine Learning Summer School (2014)  
"Recommender Systems" CMU Slides 1-58 |
| 5 | Mar 27th   | Trading securities becomes ‘simple’?          | Lecture +  
Guest Speakers: TBD          | EagleAlpha (2018) "Alternative Data: use cases“ ed. 4 p.4-14  
M. Kolanovic, R. T. Krishnamachari (2017) "Big Data and AI Strategies – Machine Learning and Alternative Data Approach to Investing", J.P. Morgan Chapter II 'Bid and Alternative Data' Section B 'Data from Individual Activity' p.30-371f |
| 6 | Apr 3rd    | Differential pricing – legit                  | Lecture +  
Exercise #1                  | Obama White House Archives (2015)"Big Data and Differential Pricing" |

* Revisited
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<td>BCG (2018) Seizing the Analytics Advantage unlocking the value of data p.25-29</td>
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<td>BCG (2018), The Digital Metamorphosis p.15-19</td>
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<td>Citi GPS (2016) “Digital Disruption” p. 96-102</td>
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<td>May 1st</td>
<td>“Risk and high risk: Walking the GDPR tightrope”</td>
<td>Lecture Exercise #2 Due</td>
<td>P. Schwartz, (2016), “Risk and high risk: Walking the GDPR tightrope”, IAPP</td>
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<td>M. Brugress (2019) “What is GDPR? The summary guide to GDPR compliance in the UK”, Wired</td>
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<td>M. Green (2016) “What is Differential Privacy?”</td>
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<td>9</td>
<td>May 8th</td>
<td>To blockchain or not to blockchain</td>
<td>Lecture + Case Study #2: NG Blockchain applications</td>
<td>CB Insights (2017) “What Is Blockchain Technology”</td>
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<td>C. Skinner (2019) “Blockchain is dead”</td>
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<td>May 15th</td>
<td>Web 3.0, NFTs, DeFi – the future of blockchain</td>
<td>Lecture + Guest Lecturer: TBD</td>
<td>Insider Intelligence (2022) “The growing list of applications and use cases of blockchain technology in business and life”</td>
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<td>Blockdata (2022) “Blockchain adoption by the world’s top 100 public companies”</td>
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<td>CB Insight (2021) “NFTs: Is the Spotlight-Stealing Blockchain Tech A Cash Grab Or”</td>
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<td>The Next Big Thing?*</td>
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<td>Course Summary, feedback and test preparation</td>
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