Project in Big data and business intelligence (99100)

Thursday 16:00-19:00

Teaching Staff:
Instructor: Yaarit Lotan [yaarit.lotan@technion.ac.il]
TA's: Yael Henquin-Malerevich [yaelhm@technion.ac.il]
Office Hours: by appointment

Prerequisites: Python
Credits: 5 points

Course Goals and Description
Through direct collaboration with industry partners, the course aims to solve real-world business intelligence challenges using AI techniques.

Students will work in a diverse team of 3-4 students. The team will go through the full process of solving a business problem using AI: Problem definition, data collection and preparation, evaluation of different solutions and tradeoffs, solution implementation, deployment, and customer feedback.

Learning Outcomes
- Gain practical experience in solving business problems using AI tools.
- Work on "real world" problem for a customer that will provide required data.
- Practice teamwork and presentation skills.

Course Content/Topics
- Practical tools and methodologies to solve business problem using machine learning.
- Industry & academic use cases for applying AI to solve business challenges.

Assignments and Grading Procedures
Class participation- 20%
Project submissions - 70%
Customer satisfaction – 10%

Project Kickoff- 8/5/2024

As part of the course, every team should find an industry partner who will work with them on the problem and provide relevant data.

Teams that are unable to identify a project will receive assistance from teaching staff.

Please note:
- Due to the tight schedule, it is preferred to choose a project in one of the team member's domains expertise.
- Your customer should assign a contact point who can provide problem definition, relevant data, help with KPI and feedback.
- Rules of thumb for choosing dataset for your project:
    - Make sure you obtained it legally.

Tabular Dataset	>=10 features Contains both continuous (numerical) features and categorical features >1000 records
Computer Vision dataset	For classification problem: >100 pictures per class
NLP	work with teaching staff to define

Course Schedule:
- Mid-course assignments will be presented in class followed by a Moodle submission 1 week later. You will receive a grade for your Moodle submission.
  In addition to enhancing collaboration, it provides an opportunity to gather feedback ahead of submission. Those sessions are a great opportunity, so please take advantage of it and come prepared.
- Grade of submissions and pitch is a % out of an overall 70% submission rate.

	Topics	Assignments
Week 1: **23/5**	● Process of using AI tools to solve business problems. ● Business context - Industry overview, Customers, and users ● Problem and success KPIs definition	

	o incl. AI evaluation metric (FN/FP) ● Last year projects examples	
Week 2: **30/5**	● Data collection and preparation ● Competitive analysis ● Amazon Press release - class workshop	**Project part 1 in class presentation:** - Team overview, customer's requirements. problem domain - AI benefits for this problem vs. other methods - Checkpoint that required dataset provided by the customer
Week 3: **6/6**	● Decision trees ● Deep learning intro (Computer vision, language models) ● Data analysis workshop	**Class presentation:** ● Problem and success KPIs definition (FN/FP) **Moodle submission (15%):** ● Competitive analysis ● Amazon press release
Week 4 **13/6**	● Training flow	**Class presentation:** ● Data collection process ● Features description, label, # features, dataset size. ● Data exploration analysis results
Week 5 **20/6**	● Model evaluation. ● Solution workshop	**Moodle submission (20%):** ● AI KPI definition (FP/FN) ● Data collection process ● Features description, label, # features, dataset size. ● Data exploration analysis results
Week 6 **27/6**	AI in Industry Enrichment lecture	**Class presentation:** Solution check point
Week 7 **4/7**	AI in Industry Enrichment lecture	
Week 8 **11/7**	Pitch Day	**Final in class presentation (15%):** Describe the whole process including Conclusions, next steps, and customer feedback. **Moodle submission (25%):** Solution flow and outcomes: - Model selection process and results. - Impact of result on the customer

		- Jupiter workbook (executed solution)

Course Requirements & Course Policies

Must bring laptops with required installations (per project requirements) for in class work.

Accommodation for students with special needs - will be given by need.

Textbook(s) and/or other materials

https://wesmckinney.com/book/
https://martin.zinkevich.org/rules_of_ml/rules_of_ml.pdf