ΠΑΝΕΠΙΣΤΗΜΙΟ ΠΕΙΡΑΙΩΣ
UNIVERSITY OF PIRAEUS
DEPT. OF DIGITAL SYSTEMS

MSc in
ARTIFICIAL
INTELLIGENCE

DEMOKRITOS
INST. OF INFORMATICS &
TELECOMMUNICATIONS

Προτεινόμενη θέση πρακτικής άσκησης
από KAIZEN Gaming

kaizen GAMING

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EGR OPERATOR Operator of the Year
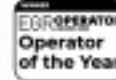
Casino Games similarity via Graphics based embeddings

Description & Problem Statement

Kaizen Gaming, besides sports betting, offers a wide selection of Casino games to our customers, e.g., roulette, blackjack and many others. These games vary in terms of type, theme, playing experience etc.

We aim to offer the best customer experience possible. One way to accomplish this is by offering a personalized experience to our customers. We aim to achieve this by using machine learning methods that find candidate games for each customer based on their personal taste. These are Recommendation Systems. A Recommendation System can use a lot of different features, both customer based and game based, to generate good recommendations. This internship project aims to investigate a set of features based on the visual graphics of the games.

Project description

An underexplored area of interest is the visual aspect when making recommendations. We want to test the hypothesis that aesthetics, i.e., the look of the games, plays an

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important role in the customer experience, and affects what games they choose to play. To validate this, we want to create features based on the image of the.

One approach is to encode the images into a multidimensional space, such as vectors, known as embeddings. In machine learning, encoding information in embeddings is a standard practice used in text, audio, and images, being one of the cornerstones of generative models. Once we encode the images, we can measure the similarity between games through the use of distance metrics on the embeddings.

Specifically, in this project, the candidate will investigate and validate different state-of-the-art image encoding techniques, e.g., autoencoders, variational autoencoders, quantized VAE etc. After analyzing the techniques and based on their findings, the candidates will provide a proposal with the best way to encode images into embeddings and then use them as features to build a recommendation system. They will work through the whole lifecycle of a machine learning project, starting from data analysis, research and model development to final evaluation. Finally, they will present their work at Kaizen Gaming, in an open final presentation. The candidate will collaborate with the ML team to achieve their goals, and will also have a dedicated mentor to assist them and guide them.

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Project Scope
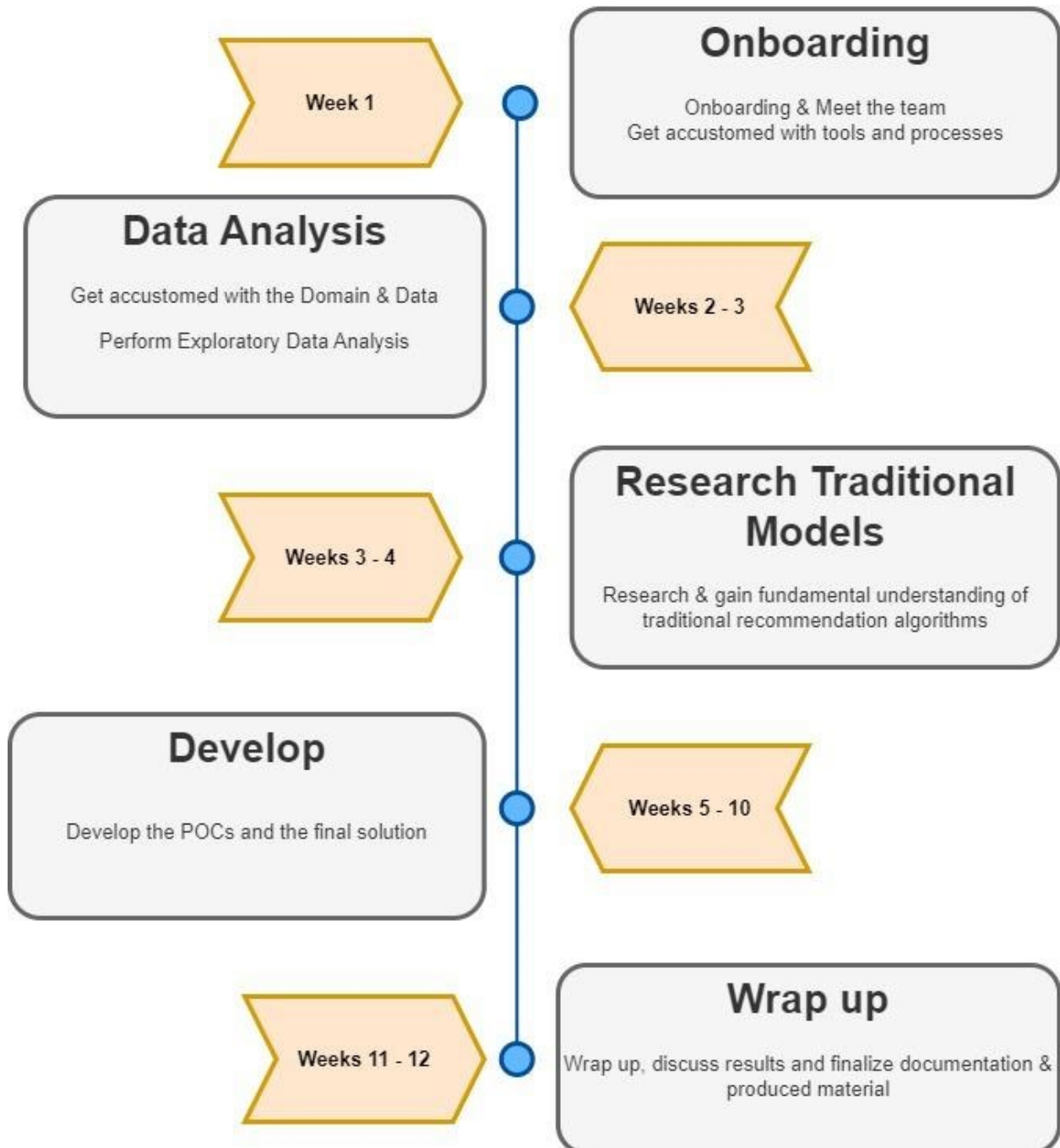
The intern will get the opportunity to:
- Dive deep into neural image encoding and their applications;
- Dive deep into recommender systems;
- Learn to work through a complete Real World Machine Learning project, including data analysis, model training, and evaluation;
- Learn to present complicated ideas into a wider audience;
- Learn to use standard MLOps tools, including code, data, model and experiment tracking.

Deliverables

During the internship the candidate's goal will be to create:

- Repo: A repository containing all the code of their project;
- Project report: A report covering their work, results and analysis;
- Project presentation: A final presentation will be conducted showcasing their work.

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Timeline

Week 1

Onboarding

Onboarding & Meet the team
Get accustomed with tools and processes

Data Analysis

Get accustomed with the Domain & Data

Perform Exploratory Data Analysis

Weeks 2 - 3

Weeks 3 - 4

Research Traditional Models

Research & gain fundamental understanding of traditional recommendation algorithms

Develop

Develop the POCs and the final solution

Weeks 5 - 10

Weeks 11 - 12

Wrap up

Wrap up, discuss results and finalize documentation & produced material

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Skills To Develop

Discover an exciting opportunity to grow your data science skills with our immersive three-month internship program. As an intern, you'll have the chance to work through the full lifecycle of a machine learning project. You will gain valuable hands-on experience and contribute to cutting-edge initiatives, going from data analysis to model evaluation. You will dive into the world of image processing using neural networks, explore the intricacies of recommender systems, and master the utilization of PySpark for big data. You will learn best practices on writing code for ML and proper code, data and experiment management. Throughout your journey, you'll collaborate with a supportive team, refining your communication skills and fostering professional growth. Wrap up your internship by showcasing your remarkable work in a final presentation, leaving a lasting impact. Take the first step towards becoming a highly sought-after data science professional with us!

- **Technical Skills:** Machine learning is a branch of artificial intelligence, which means that knowledge of programming languages is essential for a machine learning intern. The candidate will have the opportunity to further develop their skills in python programming along with Spark and PySpark for BigData.

- **Algorithms:** Algorithms are the foundation of machine learning, and understanding how they work is essential for a data scientist. The candidate will enrich their knowledge on state-of-the-art machine learning techniques with respect to Computer Vision, neural networks and other models.

- **Data analysis:** Data analysis is the process of examining large amounts of data to find patterns and draw conclusions. There is the chance to explore and gain knowledge using real-life data from an industry which is continuously evolving and a data-driven organization with vast amounts of data.

- **Communication:** Machine learning involves collaboration between many different departments and individuals. Improve and develop communication and

collaboration skills in a modern environment that fosters teamwork and work with other Data Scientists / ML engineers and Data engineers towards the same goal.