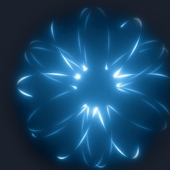


# Photon



## A data driven energy market opportunities map

LAPD 2020/21 - Prof. Liliana Ferreira

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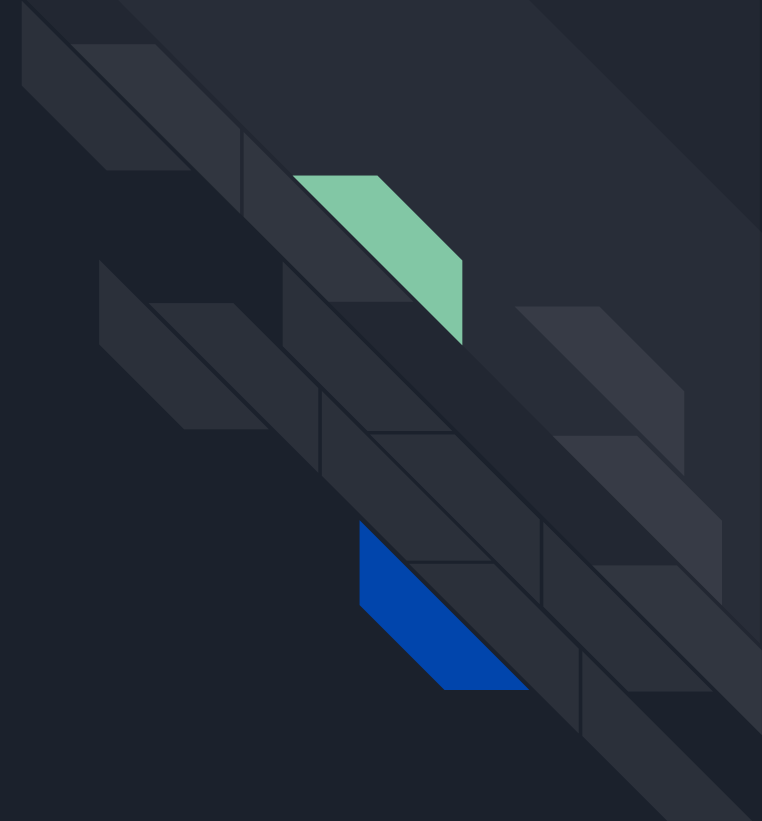
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# Table of Contents

1. Understanding the problem
2. Solution: Photon
3. Steps and Goals
4. Data Sources and Data Models
5. Tech Stack
6. Requirements
7. Prototype
8. Architecture
9. Development Roadmap





# Understanding the problem

- 01 Every day, we learn about emerging technologies and developments that have the **potential to be groundbreaking**. But how do we **detect** the early proof-of-concept, non-obvious opportunities with real growth potential?
- 02 This leads us to the broad topic of **Energy**. It's one of the biggest drivers for global issues like climate change, and when starting new projects and companies, it's important to **make sure the problem is relevant**.
- 03 The process of determining whether a problem is promising enough is not trivial. How can we **gather** and **process** the vast amount of data revolving around energy to detect the most promising, emerging and non-obvious problems that need to be solved?



# Solution: Photon

**Photon** is an application capable of:

- ❄ Extracting and analyzing energy related data from various sources
- ❄ Detecting and identifying real, high growth opportunities within the energy market and industry
- ❄ Showcasing that information to the user in an easy to use graph-based visual interface



# Steps and Goals

## Data Extraction

Development of modules that communicate with external APIs and sources in order to extract relevant, energy-related data.

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## Knowledge Graph

Parsing and interpretation of the collected data, in order to build knowledge graphs containing energy-related information.



## ML Based Prediction

ML based screening and prediction of opportunity growth potential (can be done possibly with NLP and proximity analysis)..

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## Visual Interface

Creation of a visual interface, that will present the knowledge graph to the user, to have a sound source of insight into the "problem area" of Energy.

# Data Sources

## Social Media APIs

- Reddit API
- Twitter API

Social Media APIs can tap into and extract **public conversations** as a way to understand what's **trending**, **discover insights** and listen to events.

With these APIs, it's possible to gather different metrics data and search for specific topics using **keywords** to analyze related conversations and get popular searches in the platforms.

These 2 social media platforms are specially relevant given their abundance of cutting edge discourse.





# Data Sources

## News APIs

→ Usearch API

News APIs will have a great importance in data collection. This API aggregates **news from multiple worldwide sources** and utilizes different features to distinguish them.

By using it, it will be possible to retrieve news by keywords, phrases, countries and publishers.





# Data Sources

## Patent APIs

→ LENS.ORG API

This API aggregates data points and provides information from **patents, companies and academic work**. They allow the discovery of people and companies, as well as visualizing **trends and patterns** across the innovation landscape.

It can prove to be very useful to retrieve information regarding already existing companies and projects in interesting sub areas within the Energy industry.





# Tech Stack

## React

Javascript Library to build the graph-based web interface.

## Express

NodeJS web application framework.

## Node.js

Accesses the Neo4J graph-based database in order to extract meaningful data.

## Neo4J

Leverages the data relationships between different entities.

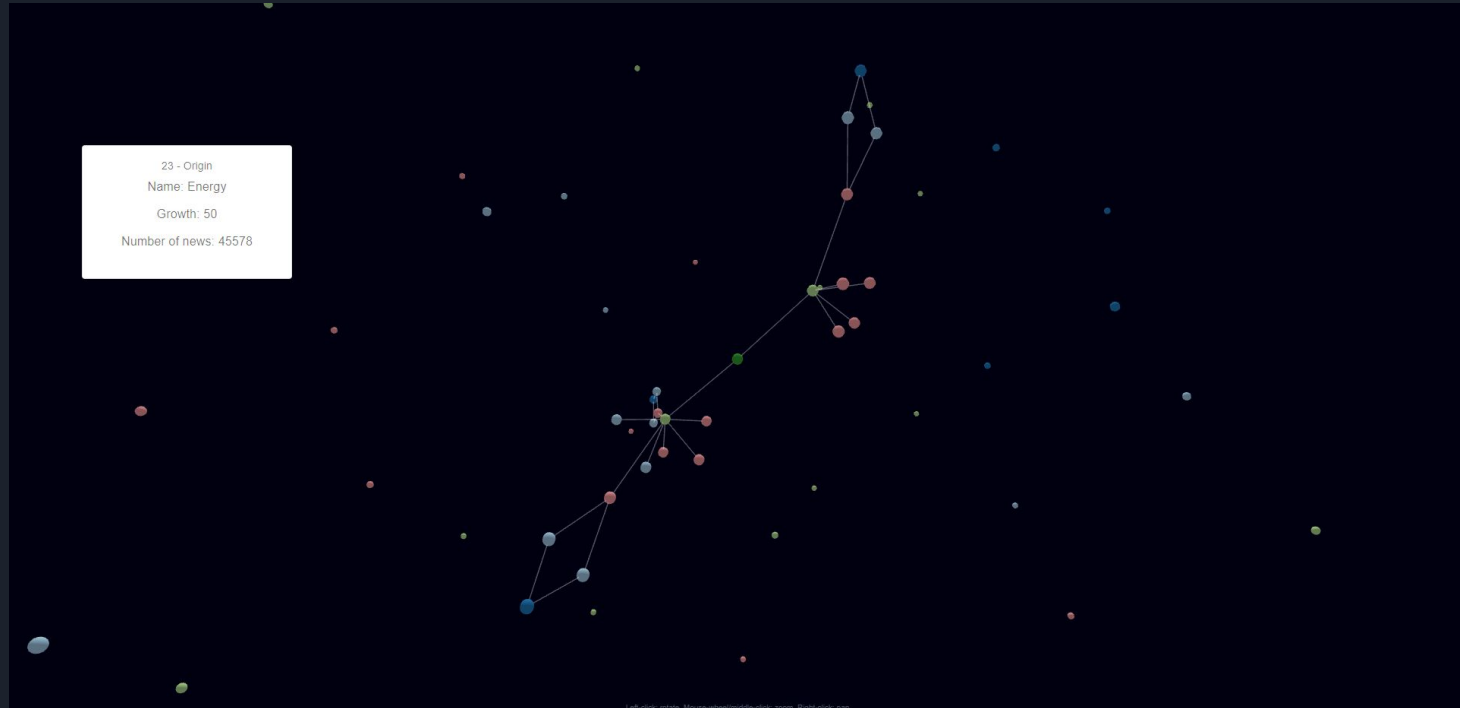




# Requirements

ID	Description	Priority	MVP
US01	As a user, I want to visualize and navigate through the graph, to be aware of the different opportunities.	High	x
US02	As a user, I want to have more information about a specific graph node (energy sub-area), so I can make a further analysis to a specific opportunity or area.	High	x
US03	As a user, I want to see all the attributes of the nodes and their relationships, so I can understand the connections and what makes a certain sub-area promising or not.	High	
US04	As a user, I want to see distinct node sizes, so that I can understand where the best opportunities lie.	Medium	
US05	As a user, I want to have information about the specific articles/posts or have some links to pertinent pages, so I can analyse in first-hand the posts and articles that were extracted for a certain sub-area or topic.	Medium	
US06	As a user, I want to have filtering options based on certain properties, to see only relevant nodes.	Low	

# Prototype



# Architecture

## Data APIs



## Data Extractor

Interacts with the APIs in order to extract and process data, and populate the DB



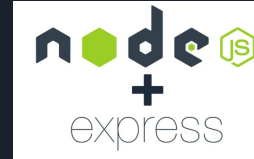
## Graph DB

Store entities and their relationships



## Controller

Extracts and processes data from Graph DB

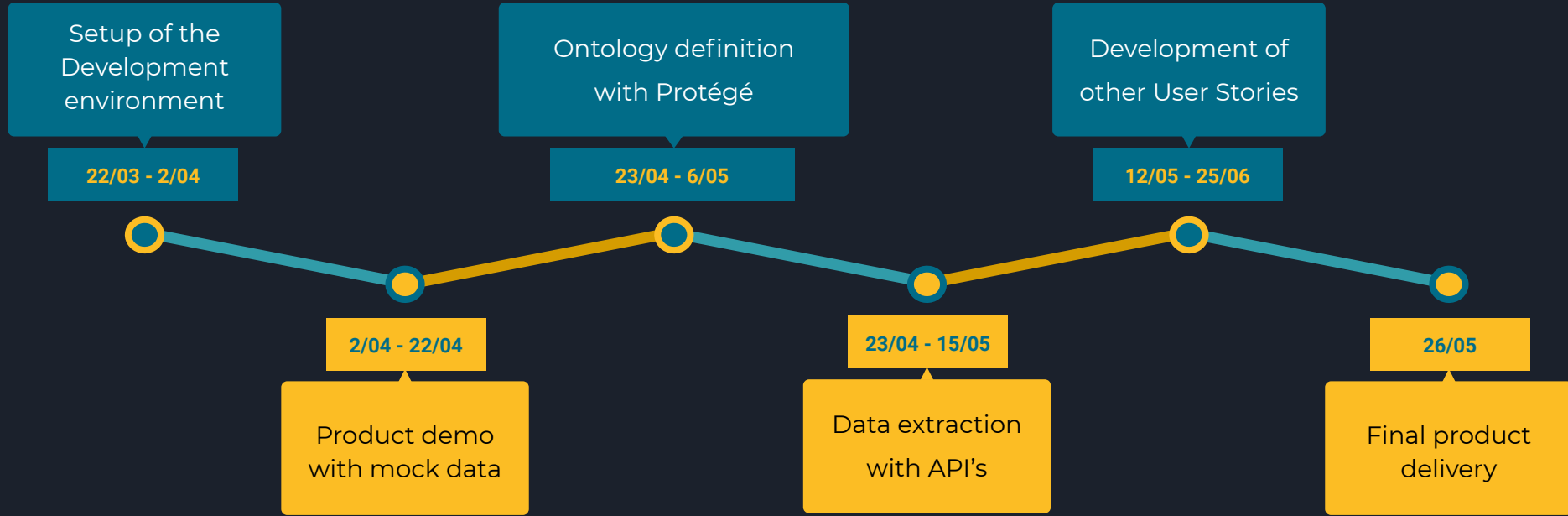


## View

Graph-based web interface and a menu with different options



# Development Roadmap





# Photon



**Thank you!**  
Questions?