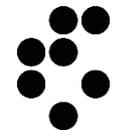


Connecting Professional Skill Demand with Supply

Erik Novak, Inna Novalija
Artificial Intelligence Laboratory
Jožef Stefan Institute

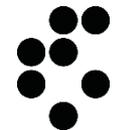
Si-KDD, October 9th, Ljubljana



Introduction

Goals

- Detect professional skills required on the job market
- Analyse the evolution of required skills
- Recommend appropriate learning material



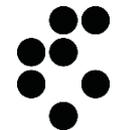
Outline

Data

- Acquisition & Enrichment
- Set Statistics

Dashboard

- Methodology
- Components



Data

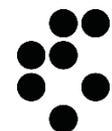
Acquisition & Enrichment

Target data - Job Postings, Courses and Lectures

Acquisition - Using dedicated API and custom crawlers

Enrichment

- Wikification
- Extracting skills using SARO ontology
- Extracting locations and countries using GeoNames ontology

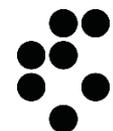
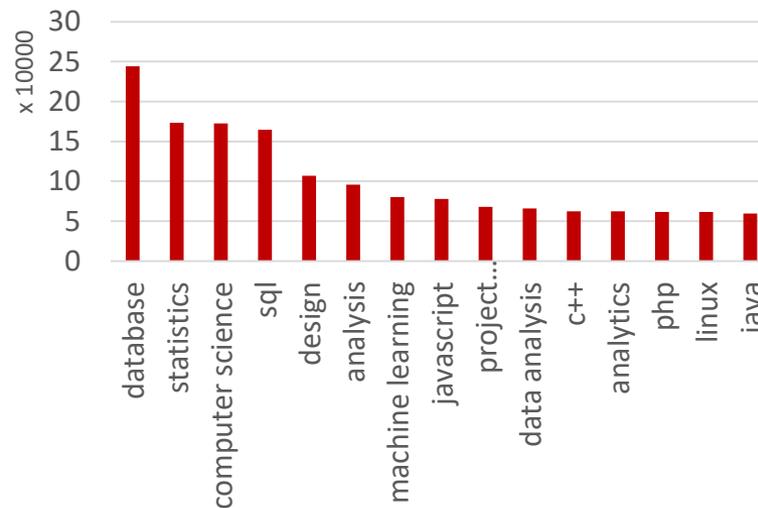
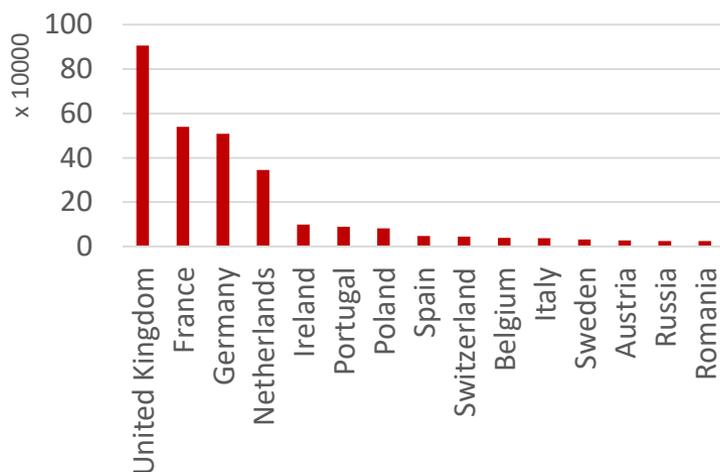


Data

Set Statistics

Job Posting Data Set

- Approx. 3.3M job postings acquired in 18 months
- 144 countries – majority of job postings in Europe
- 650 unique skills extracted

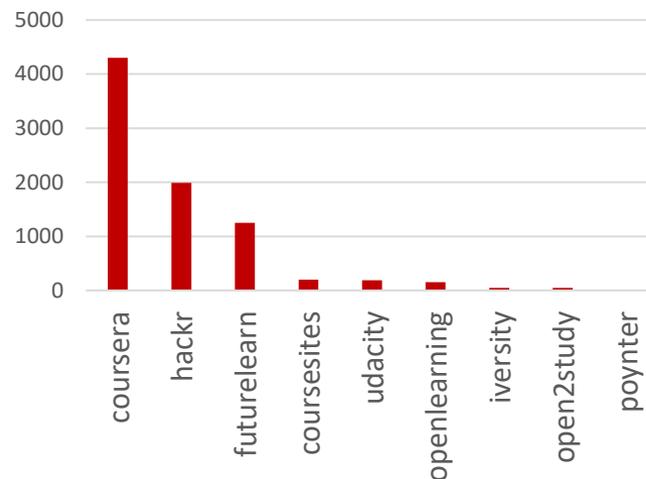


Data

Set Statistics (cont.)

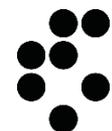
Course Data Set

- 63k courses; 8k online & 55k offline
- Information available – title, description, course provider etc.



VideoLectures Data Set

- Over 20k video lectures
- Information available - title, description, link to lecture etc.



Dashboard

DATA SCIENTIST / BIG DATA ANALYST

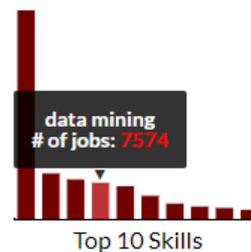
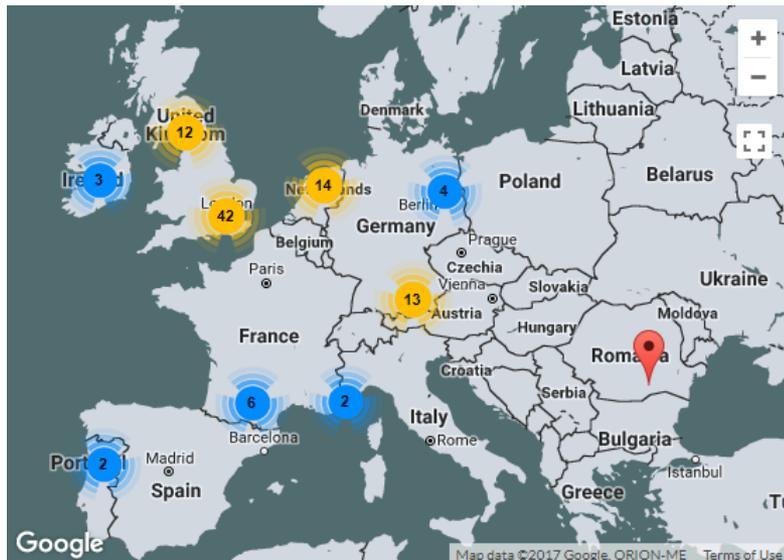
Raona, Barcelona, Spain

PUBLISHED ON AUGUST 28, 2017

machine learning

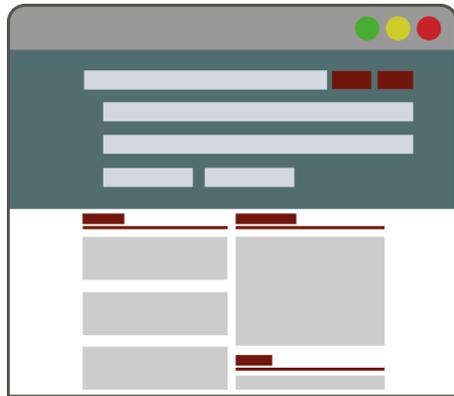
DESCRIPTION

En Raona buscamos un Data Scientist creativo, con ganas de empezar proyectos nuevos e imaginar aplicaciones donde podamos aplicar machine learning en nuestro... Hace 2 días en trabajos



Dashboard

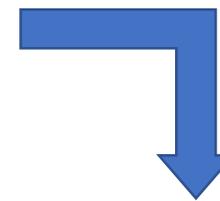
Methodology



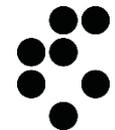
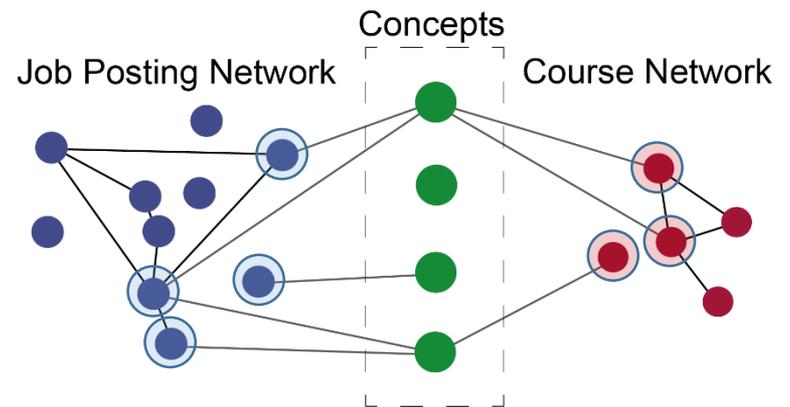
Wikify
text query



Result search and
filtering using
query information



Calculate basic statistics
and return results



Dashboard DEMO

Search ⚙️

Required Skills: Type a skill

Search Locations: City or country names

Select Time: Clear Last week Last month

ANALYST (M/W) FÜR DIE THEMENBEREICHE INDUSTRIE 4.0 UND MACHINE LEARNING

BearingPoint GmbH, Schoenholz, Germany
PUBLISHED ON SEPTEMBER 21, 2017

statistics analysis machine learning

DESCRIPTION
... im Bereich Operations (z.B. Maintenance) optimiert werden können. Besonderen Fokus legen wir hierbei auf Ansätze, die auf Machine Learning basieren. Während Ihrer Tätigkeit bei uns ... - Sehr gute deutsche und englische Sprachkenntnisse - strukturiertes und selbstständiges Arbeiten - hohe IT-Affinität - Kenntnisse in statistischen Methoden / Machine Learning ...

CONSULTANT (W/M) ARTIFICIAL INTELLIGENCE AND COGNITIVE COMPUTING FOR FINANCIAL SERVICES

PwC, Schoenholz, Germany
PUBLISHED ON SEPTEMBER 21, 2017

artificial intelligence machine learning

DESCRIPTION
- Programmen sowie in Machine Learning Verfahren oder Natural Language Processing.
- Beruflicher Hintergrund oder Branchenwissen im Umfeld Financial Services sind von Vorteil. - Sehr gute ...

CONSULTANT (W/M) ARTIFICIAL INTELLIGENCE AND COGNITIVE COMPUTING FOR FINANCIAL SERVICES

VIDELECTURES



Introduction to Complexity Science

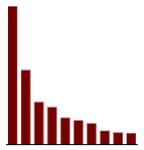
Disclaimer: Due to technical difficulties experienced during filming of this lecture the audio quality of the video is poor.



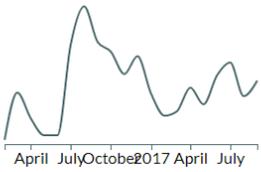
NTU Winter School on Complexity Science, Singapore 2017

What is complexity science?
What are complex systems?
And why do physicists like Stephen Hawking and Heinz Pagels think complexity science will be a dominant force, not only in shaping our pursuit of scientific truth, but

SKILLS / JOB DEMAND TIMELINE



Top 10 Skills



April July October 2017 April July

MAP





Dashboard

Components

DATA SCIENTIST / BIG DATA ANALYST

Raona, Barcelona, Spain

PUBLISHED ON AUGUST 28, 2017

machine learning

DESCRIPTION

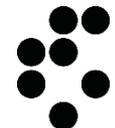
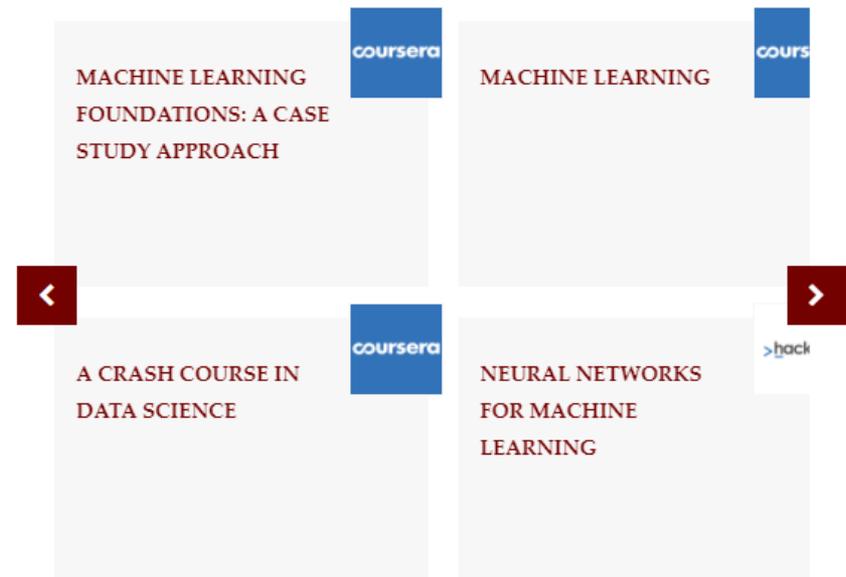
En Raona buscamos un Data Scientist creativo, con ganas de empezar proyectos nuevos e imaginar aplicaciones donde podamos aplicar machine learning en nuestro... Hace 2 días en trabajos

Recommended courses

- Different online course providers
- Clicking on course redirects to the course provider

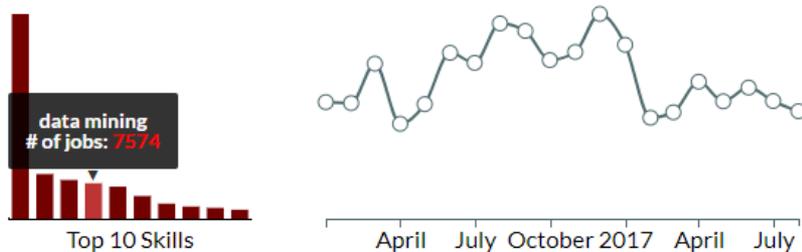
List of Job Postings

- Title, description, skills etc.
- Job postings written in different languages



Dashboard

Components (cont.)

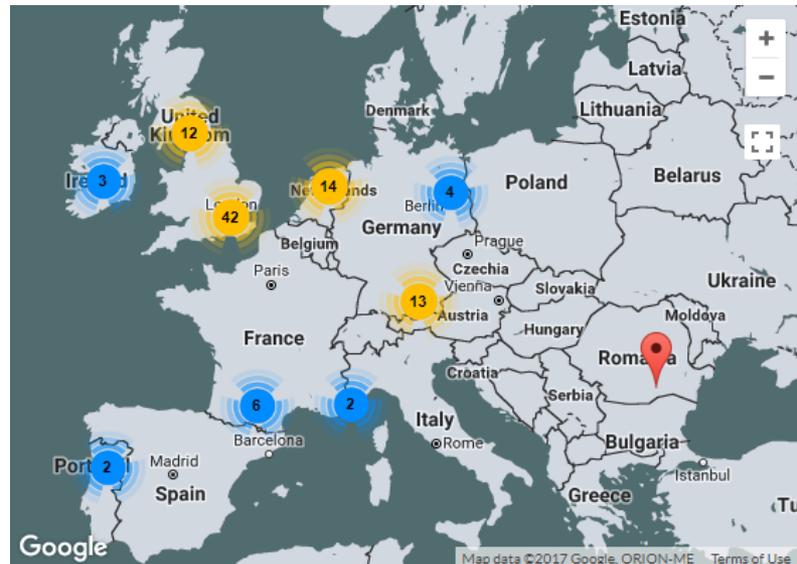


Basic statistics

- Ten most demanded skills histogram
- Number of job positions timeline

Top hiring locations

- Location clustering
- Clicking on pin shows location name and number of job postings



Future Work

- Improve Skill Extraction
- Add and Improve Dashboard Features
- Continue Acquiring Data

Dashboard available at <http://jobs.videolectures.net>

Acknowledgements: This project was supported by the **Slovenian Research Agency, EDSA** EU H2020 project (Contract no: H2020-ICT-643937) and **RENOIR** EU H2020 project under Marie Skłodowska-Curie Grant Agreement No. 691152.

