Mohamed Bilel Hasni

Curriculum Vitæ

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Date of Birth	05/06/1995
Linkedin	linkedin.com/hasnimedbilel
Github	github.com/hasnimedbilel
Blog	medium.com/hasnimedbilel
Kaggle	kaggle.com/hasnimedbilel
Zindi	zindi.africa/bilel
Competence areas	Data Science, Machine Learning, Computer Vision, Natural Language Processing, Statistics, Data Mining, Information Retrieval, Data Engineering

Experience

Jan 2020– Ongoing   **Data Scientist**, CREATIV-CEUTICAL, TUNISIA.
- Application of AI in the healthcare industry: Clustering, unsupervised learning, Natural Language processing, Image processing ...
- Data Engineering, Data Warehousing, ETL, PySpark, SQL, Dask, Pandas.
- Data visualization & Dashboarding.

Jan 2019–Oct 2019   **Data Science Intern**, SMARTTEK SERVICES, DUBAI.
- Implemented a research paper on most important factors in uncovering Simbox fraud behaviour.
- Handling large telco datasets: Extraction of CDR (Call Data Records), Create Datawarehouse using Apache Hive.
- Data cleaning and transformation using Pyspark.
- Data loading into Rapidminer Platform.
- Implemented a Machine Learning solution to detect Simbox fraud in a Tunisian Telco operator.
- Implemented a distributed version of the solution using Hortonworks Data Platform (HDP) and Rapidminer, on a cluster of VMs.
- Monitoring of the HDP cluster using Apache Ambari.
  keywords: DataWarehousing, ETL, Hive, SQL, Pyspark, Rapidminer, HDP, Apache Ambari

May 2018–Sep 2018   **Data Science Intern**, KAOUN, TUNISIA.
- Design and creation of a data Warehouse using the ETL integration process.
- Implemented Machine Learning techniques to predict bank customers loan repayment ability.

Projects

InstaPaper   **Data Capturing from audit report images using Deep Learning**, *Project funded by the World Bank.*
- Designed and implemented a Deep Learning solution to help the court of audit of Tunisia reduce the manual work of processing audit reports.
- Automatic Data capturing of report images.
- Automatic generation of custom Key Indicators & visualization Charts/graphics.
- Productionize the model as a REST API.
  keywords: Data Capturing, Python, Pytorch, Deep Learning, Image segmentation, Detectron, Resnet, Text Detection (CRAFT), Text Recognition (CRNN), FLASK

TAK **Treatment sequences analysis using Kmeans Clustering**.
  ○ Developed a state of the art solution to represent patient's treatment sequences in an intuitive visual format.
  ○ Extraction, transformation and loading of clinical data from different sources to create a DataWarehouse. The objective is to obtain, in a single view, all patients' treatment data. (ETL, SQL, PostgreSQL)
  ○ Used unsupervised learning coupled with image processing techniques to reveal hidden patterns in complex treatment sequences.
  ○ Automatic assessment of the stability of clusters of patients found.
  ○ Productionized the solution into a web application using Flask, bootstrap, Docker.
  ○ Accepted Poster publication for **ISPOR 2022** conference. Link : [tak_abstract]
  keywords: ETL, SQL, PostgreSQL, Needleman Wunsch sequences alignment algorithm, Hierachical Clustering, Image processing, Clustering stability evaluation, FLASK, Bootstrap, NGINX

Abstractron **NLP solution to support in literature abstract selection and text classification process**.
  ○ design/implementation of a ETL+Datawarehouse system in PostgreSQL in order to collect abstracts and prepare them for further analysis.
  ○ design/implementation of a multi-modal solution to deal with inputs of different types.
  ○ re-train Transformers using BioBert pretrained embeddings (Masked Language Modeling)
  ○ averaging embeddings of different inputs to produce a final data representation used for abstract classification task.
  ○ define custom loss function to deal with class imbalance.
  ○ Create a Rest API of the final model in order to be consumed in a web App.
  keywords: Python, Datawarehouse, ETL, Data preprocessing, Pytorch, Transformers, BioBert embeddings, domain adaptation, Attention models, encoder-decoder architecture, multi-modal learning, FLASK

Newton **Regularized Newton-Raphson method for machine learning**.
Method
  ○ Implemented the paper [NewtonMethod] to develop a second order derivative algorithm to solve convex optimization problems. [Code]

Tableau **Tableau Dashboard** .
  ○ Extraction of clinical trials data for a specific set of countries and creation of a DataWarehouse.
  ○ Used Tableau Prep in order to tranform/load the data for further analysis.
  ○ Developed customized reports in Tableau representing Clinical trials data.
  ○ Used Tableau server to deploy the project and make it available for the clients.
  ○ Being in charge of Tableau server administration in terms of users management, access control ...
  keywords: DataWarehousing, SQL, SQLAlchemy, PostgreSQL, ETL, Tableau, Tableau Server

Publications

2022 TAK (Treatment Sequences Analysis Through K-Clustering), [ispor]

2022 Could Artificial Intelligence Support Prediction of Reimbursement Decisions in Scotland? A Pilot Project, [ispor]

2022 Promises of AI-Assisted Patient Monitoring Methods, [ispor]

Education

2016–2019 **National Engineering School of Sousse, Tunisia**,
Computer-Science Engineering degree.

2014–2016 **Preparatory Institute of engineering studies el Manar, Tunisia**,
Mathematics & Physics.

Achievements

1st Prize **Hack for Transparency**, *WorldBank*.
  ○ National competition organized by the World Bank in collaboration with the court of audit of Tunisia.

1st Prize **ENISO IOT Challenge**.
  ○ Inter Engineering-schools IOT competition organized by the National Engineering School of Sousse.

5th place **Predict Floods in Southern Malawi**, *Zindi competition*.
  ○ Placed 5th out of 1562 participants. Link to solution blog: [medium]

3rd prize **Orange tech club IOT challenge**.
  ○ 24h inter-engineering schools challenge organized by Orange Tunisia.

Kaggle Top 6%	**University of Liverpool - Ion Switching**.
	○ Bronze Medal

Competences & Skills

Languages	Python, R, Java, C, SQL
ML Frameworks	Keras, PyTorch, scikit-learn, H2O, Rapidminer
Data Engineering	MySQL, PostgreSQL, PySpark, Dask, Pandas, Hortonworks Data Platform, Apache Hive
Data Vis & Dashboarding	Tableau, Plotly, Matplotlib, R-Shiny
Statistics	Hypothesis testing, Bayesian inference, Frequentist statistics, Regression analysis
WebD	HTML/CSS, JavaScript, Bootstrap, FLASK, Django
Utilities	Anaconda, Git, VSCode, PyCharm, Jupyter Notebook, RStudio
Service development	Deploying ML Models, API services, Docker
Team and Project Leading	Mentoring internships in Enterprise, coordination experience in Enterprise and Academic activities
Communication	English, French, Arabic