

# Abdelkhalek Bakkari

## PYTHON DEVELOPER



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## Experience

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### 2010-03 - 2012-04 **Tunisiana**

*Python and C++ Software Developer*

- Collaborate with growing team of Python /C++/ Linux developers to design, develop, test, and support new and existing features,
- Strive for high quality and reliability,
- Translate high-level customer requirements into sensible technical solution in French and English language
- Troubleshoot the problems of Networking and Programming,
- Detailed documentation of use-cases and deployment scenarios in French and English language

### 2012-05 - 2015-05 **Focus & Focus International**

*Python Developer*

- Technical support for created applications and Worked in all areas of Jenkins setting up CI for new branches, build automation, plugin management and securing Jenkins and setting up master/slave configurations.
- Integrating various Version control tools, build tools, nexus and deployment methodologies (scripting) into Jenkins to create an end-to-end orchestration build cycles.
- Troubleshoot build issues in Jenkins, performance and generating metrics on master's performance along with jobs usage.
- Testing applications using TDD with automated test tools including nose, py.test and tox. Advanced use and configuration of Jenkins jobs, slaves and executors
- Providing technical documentation for created tools,
- Documentation and reports in French and English language

### 2015-09 – 2017-03 **Hemmersbach**

*Python and Machine Learning Developer*

- Very advanced collection and analytics platform: The projects is about to build advanced user on boarding.
- Maintenance of the implemented tool
- Built the Scraper tool using python and selenium.
- Implementation of Machine learning projects: 3D Medical Image Segmentation based on Super-pixels.
- This project was done using numpy, VTK, CTK, PythonQt, Git, and bridge of standard python.
- Object Tracking based on OpenCV and Python for the Football club of the company.

2017-04 – Present

**MPIXEL**

*Senior Python Developer and Data Scientist*

My primary goal at MPIXEL is to turn the transient nature of contracting to my advantage by working with as many varied clients as possible in order to boost my experience by gaining exposure to a wide variety of technical environments. I always focus on creating high quality code that could be maintained after any particular contract had ended. MPIXEL has thirteen clients, of which I provide a selection projects ( Personal Projects). Additionally, I am working with version control systems like GIT and used Source code management client tools like GitBash, GitHub, Git Lab and Gitlab CI and Jenkins for CI and for End-to-End automation for all build and CD.

As a Data Scientist, I was responsible for:

- Improved data mining processes, resulting in a 20% decrease in time needed to infer insights from customer data used to develop marketing strategies
- Used predictive analytics such as machine learning and data mining techniques to forecast company sales of new products with a 95% accuracy rate
- Increased data security by updating companywide encryption, steganography, IP security, and secure wireless transmission practices
- Developed ETS for data sources used for reporting by sales, inventory, and marketing departments

## Education

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2010-09 - 2012-11

**High Institute of Computer Science and Management Kairouan (ISIGK), Tunisia,  
Master degree in Intelligent Information Systems**

Medical Image Segmentation based on Fuzzy Logic

2007-09 - 2010-06

**Fundamental Licence (Bachelor's Degree) in Computer Science, Faculty of  
Sciences of Gafsa (Tunisia)**

Study of positioning protocols for low power low voltage wireless networks

## Skills

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Linux	■ ■ ■ ■ ■
Python	■ ■ ■ ■ ■
Django	■ ■ ■ ■ ■
SQL	■ ■ ■ ■ ■
SQLAlchemy	■ ■ ■ ■ ■
Celery	■ ■ ■ ■ ■
Pytest	■ ■ ■ ■ ■
Latex, X ++, Microsoft SQL Server, Matlab, C / C ++, Microsoft Office (Word, Power Point, Excell)	■ ■ ■ ■ ■
Git	■ ■ ■ ■ ■
JIRA	■ ■ ■ ■ ■
Jenkins	■ ■ ■ ■ ■

## Languages

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Arabic



French



English



Polish



## Certificates

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2014-04	C++ Essential Training, Lynda, License AACCA7
2015-06	Initiation à la programmation (en C++). Ecole Polytechnique de Lausanne, Coursera
2015-11	C++ Smart Pointers. Lynda, License 4C451B.
2016-02	Code Clinic: C++, Lynda. License E2108F
2016-05	C++ programming in Qt Framework Part I, udemy. License UC-1EI
2016-07	C++ programming in Qt Framework Part II, udemy. License UC-4FZ51VHQ
2018-09	Python Essential Training, LinkedIn Learning
2018-11	Learning Python, LinkedIn Learning
2018-11	Learning the Python 3 Standard Library, LinkedIn Learning,
2019-01	Introduction to Python for Data Science, Data Camp, License #6632412
2019-03	Intermediate Python for Data Science, Data Camp, License #9174046
2019-04	Object-Oriented Programming in Python, Data Camp, License #9378159

## Interests

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Data Science

Networking

Machine Learning

TCP/IP model

ISO/OSI model

HTTP and TCP/IP protocols

3G/4G/5G, Network Engineering, Medical Image Processing, Three Dimensional Image Analysis, Computer

Vision, Academic English Writing

Network and System Security

## List of publications

1. **Abdelkhalek Bakkari** and Anna Fabijańska: Segmentation of Cerebrospinal Fluid from 3D CT Brain Scans Using Modified Fuzzy C-Means Based on Super-Voxels. Proceedings of the 2015 Federated Conference on Computer Science and Information Systems (FedCSIS 2015), Lodz, Poland, 13-16th September, 2015, M. Ganzha, L. Maciaszek, M. Paprzycki (eds). ACSIS, Vol. 5, pages 809–818 (2015), DOI: <http://dx.doi.org/10.15439/2015F154> (Web of Science), also in IEEE Xplore Digital Library: <http://ieeexplore.ieee.org/document/7321525/>
2. **Abdelkhalek Bakkari** and Anna Fabijańska. Features Determination from Super-voxels obtained with Relative Linear Interactive Clustering. Image Processing and Communications, 21.3 (2016): 69-79.

3. **Abdelkhalek Bakkari**, Ezzedine Ben Braiek, Ines Njeh and Ahmed Ben Hamida: Automatic Brain MR Perfusion Image Segmentation Using Adaptive Diffusion Flow Active Contours Based on Modified Fuzzy C Means. Advanced Technologies for Signal and Image Processing (ATSIP 2014), Sousse, Tunisia, 17-19th March, 2014, pages 2014-2018 (2014), IEEE Xplore Digital Library: <http://ieeexplore.ieee.org/document/6834609/>
4. **Abdelkhalek Bakkari** and Anna Fabijańska. Interactive Framework for 3D CT/MRI Image Segmentation Based on Points Cloud Deformation. IET Image Processing Journal (Status: Accepted in April 2019)

## List of presentations

1. **Abdelkhalek Bakkari**: Comparison of 3D image segmentation approaches based on fuzzy logic rules. Seminar on Signal Processing and Analysis for Vision and Control Systems, Slok near Belchatow, Poland, 17-18th of June 2015 (CD ROM).
2. **Abdelkhalek Bakkari**, Anna Fabijańska: Feature determination from RLIC supervoxels. Seminar on Signal Processing and Analysis for Vision and Control Systems, Slok near Belchatow, Poland, 22-23rd of June 2016 (CD ROM).
3. **Abdelkhalek Bakkari** and Anna Fabijańska: 3D CT brain image segmentation using modified fuzzy C-means based on super-voxels. 3rd Scientific and Technical Conference combined with PhD workshop: Applications of Computer Science in Electrical Engineering, Konopnica, Poland, 24th of September 2015.
4. **Abdelkhalek Bakkari** and Anna Fabijańska: Segmentation of Cerebrospinal Fluid from 3D CT Brain Scans Using Modified Fuzzy C-Means Based on Super-Voxels, Federated Conference on Computer Science and Information Systems, Lodz, Poland, 13-16th September, 2015.

## Personal Projects

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### BUSINESS SECTORS

### JOB SKILLS

- ✓ Machine Learning
- ✓ Big Data
- ✓ Artificial Intelligence
- ✓ Image and Video Processing
- ✓ Object Recognition

- ✓ Identification of customer needs.
- ✓ Writing functional and technical specifications.
- ✓ Design and modelling applications.
- ✓ Costing and planning tasks.
- ✓ Developing a complex algorithm.
- ✓ Developing Unit Test and writing Test Case.
- ✓ Customers support and bug fix.
- ✓ Team Management.

### TECHNOLOGIES MASTERED

- ✓ Programming language : Python, C++, C, Javascript, HTML, CSS, PHP, MatLab
- ✓ Frameworks and Python Libraries: Django, Pandas, Flask, Flaskrestplus, Cython, Tensorflow, Theano, Matplotlib, Seaborn, Scikit-learn, NumPy, SciPy, Bokeh, Plotly, Keras.
- ✓ Data Base : MySQL, Oracle
- ✓ Build Tools : PyBuilder, tox, coverage, nose, GIT
- ✓ Continuous Integration: Jenkins, Go CD, BuildBot, TeamCity.
- ✓ IDE : PyCharm, Spyder, IDLE (and IdleX), Atom,
- ✓ Methodology : Agile

## 1- Project Context

- ❖ Develop and design heavily predictive and prescriptive algorithmic or AI/Machine Learning and web based solutions.
- ❖ Build, enhance, monitor and maintain cloud micro-service infrastructure and data pipelines needed to bring code to production
- ❖ Develop in a continuous integration environment. Quality and accuracy in our results are crucial to our success.
- ❖ Develop and implement solutions using different functional, object-oriented, and/or scripting programming languages.
- ❖ Assess features and enhancements and communicate questions/concerns.
- ❖ Identifies, troubleshoots and debugs defects in designated code and in production environments.

### Fulfillments

- ✓ Analysis of new requests.
- ✓ Writing functional and technical specification.
- ✓ Writing a technical proposal.
- ✓ Estimation of requests.
- ✓ Development of new features.
- ✓ Writing Test case report.

### Assessment

#### Individual competencies assessment

- ✓ Applying agile methodology, good knowledge of public contract sector.
- ✓ Experience in team leader and team management experience.

#### Technical environment

- ✓ Language : Python 2 and C++.
- ✓ User Interface : Qt for C++ and PyQt for Python.
- ✓ Frameworks and Libraries: Django, Apache Hadoop, Kafka/Spark
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ Build : PyBuilder.

## 2- Project Context

- ❖ Design, develop, test, and deploy software and web solutions for solving machine learning problems using Python and other common programming languages, as well as apply best practices of software engineering such as iterative, adaptive approaches
- ❖ Document activities and results with memos, internal reports, and external publications Integration of user-facing elements developed by developers with server side logic
- ❖ Participate in technical project reviews

### Fulfillments

- ✓ Analysis of new offers.
- ✓ Writing software solutions for solving machine learning problems.
- ✓ Writing a technical proposal.
- ✓ Estimation of projects deadlines.
- ✓ Development of new features.
- ✓ Send the final code to the test and validation developers.

### Assessment

#### Individual competencies assessment

- ✓ Goals achieved before deadlines with a very good performance of the developed projects.
- ✓ Customers were very satisfied.

#### Technical environment

- ✓ Language : Python.
- ✓ Libraries : Django, OpenCV, Pandas, Tensorflow, Theano.
- ✓ User Interface : PyQt for Python.
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ IDE : PyCharm
- ✓ Build : PyBuilder.

### 3- Project Context

The algorithm was divided into two parts:

\*) Training Stage: I adopted a CNN that takes as input the content of a bounding box of one instance and gives a binary segmentation for that instance.

\*\*\*) Testing Stage: The user provides a bounding box, and BIFSeg extracts the region inside the bounding box and feeds it into the pre-trained CNN with a forward pass to obtain an initial segmentation.

#### Fulfillments

- ✓ Writing machine learning solutions for the existed problems.
- ✓ Support the client with redaction of a research article.
- ✓ Estimation and respect of the project deadline.
- ✓ Implementation of new features.
- ✓ Test and validation of the implemented software.

#### Assessment

##### Individual competencies assessment

- ✓ Goals achieved before deadlines with a very good performance of the developed projects.
- ✓ Customers were very satisfied.

#### Technical environment

- ✓ Language : Python.
- ✓ Libraries : OpenCV, Pandas, Tensorflow, Theano.
- ✓ User Interface : PyQt for Python.
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ Framework web: Flask
- ✓ IDE : PyCharm
- ✓ Build : PyBuilder.

### 4- Project Context

A deep learning model based on the U-Net convolutional network architecture was implemented to perform automatic segmentation. The U-Net model adopts a weighted cross-entropy loss function between the true segmentation value and the output for our model.

#### Fulfillments

- ✓ Writing machine-learning solutions for the existed problems.
- ✓ Support the client with redaction of a research article.
- ✓ Estimation and respect of the project deadline.
- ✓ Implementation of new features.
- ✓ Test and validation of the implemented software.

#### Assessment

##### Individual competencies assessment

- ✓ Goals achieved before deadlines with a very good performance of the developed projects.
- ✓ Customers were very satisfied.

## Technical environment

- ✓ Language : Python.
- ✓ Libraries : OpenCV, Pandas, Tensorflow, Theano.
- ✓ User Interface : PyQt for Python.
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ IDE : PyCharm
- ✓ Build : PyBuilder.

Freelance client

May 2017 – April 2018

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Machine Learning Developer: Stock Prices Predictor based on Machine Learning

### 5- Project Context

In this project, Pandas was used as a Python library in order to estimate the stock prices. The first step is to create a dataframe that contains only the Date and Close price columns, then split it into train and validation sets to verify our predictions.

#### Fulfillments

- ✓ Writing machine learning solutions for the existed problems.
- ✓ Support the client with redaction of a research article.
- ✓ Estimation and respect of the project deadline.
- ✓ Implementation of new features.
- ✓ Test and validation of the implemented software.
- ✓

#### Assessment

##### Individual competencies assessment

- ✓ Goals achieved before deadlines with a very good performance of the developed projects.
- ✓ Customers were very satisfied.

## Technical environment

- ✓ Language : Python.
- ✓ Libraries : Pandas, Numpy
- ✓ User Interface : PyQt for Python.
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ IDE : PyCharm
- ✓ Build : PyBuilder.

Freelance client

June 2018 – January 2019

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Cybersecurity project: Penetration Evaluation and Testing + Maintenance

### 6- Project Context

In this project, socket was adopted as a Python library to test and evaluate the possible attacks. The detection of attack should be fast and reliable in order to block any infiltration to the data.

#### Fulfillments

- ✓ Writing real-time solutions for the problems and a correction of the issues.
- ✓ Support the client with redaction of a detailed documentation.
- ✓ Estimation and respect of the project deadline.
- ✓ Developpement of new tools and updates.
- ✓ Test and validation of the implemented software.

## Assessment

### Individual competencies assessment

- ✓ Goals achieved before deadlines with a very good performance of the developed projects.
- ✓ Customers were very satisfied.

### Technical environment

- ✓ Language : Python.
- ✓ Libraries : MicroPython, Cython, Jython, Skulpt (JS), PyPy and socket
- ✓ User Interface : PyQt for Python.
- ✓ Data Base : SQL, Oracle, Mysql.
- ✓ IDE : PyCharm
- ✓ Build : PyBuilder



