

# Mohamed Megahed

DATA ENGINEER · SOFTWARE DEVELOPER

Brussels, Belgium

✉ mohamed.megahed.abas@gmail.com | 🌐 megahed.it | 📺 momegahed | 📄 mohamed-megahed-abas

“Our greatest successes come from our freedom to fail.”

## Experience

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### Food and Agriculture Organization of the United Nations

Multiple locations

CLOUD DATA ENGINEER

Oct. 2019 - Present

- Developed a statistical data pipeline that supports dynamic ETL processes using Google cloud native technologies.
- Designed, Maintained, and improved multiple data warehouses using technologies like Bigquery, Google Cloud Storage (GCS), and Google Earth Engine (GEE).
- Developed a Web Map Tile Service (WMTS) server that serves 60k QPM in production using Unicorn, Flask, GCS, Cloud Run, and GEE.
- Increased WMTS server response time by 60% by applying selective caching and the use of Content Delivery Network (CDN).
- Maintained, and improved an Apache Airflow instance to create, and manage ETL and ELT data pipelines that are used to pull data from external providers to FAO warehouses. It also uses spark on cloud Dataproc to utilize clustering and concurrency.
- Designed, and Implemented the geospatial analysis microservice that provides on the fly advanced zonal statistics (more than 40 different operators) over collections of geospatial data to end users while maintaining an average latency of 5 seconds.
- Conducted thorough analysis on unsupervised learning models and designed metrics to evaluate their performance.
- Designed, implemented, and automated advanced workflows that automatically generate new geospatial data from their components, validate, and publish them using Cloud functions, GEE, Cloud Run, Cloud Scheduler, GCS, GDAL, Javascript, and Python.
- Designed, implemented, and automated pipelines to publish 10+ datasets on Google Earth Engine data catalog and keep them up-to-date.
- Reduced average API response latency by 42% by optimizing the algorithms used, and implementing parallel and distributed computing wherever possible.
- Reduced server cost of specific microservices by 65% on average by migrating to serverless solutions.
- Contributed to the development and evaluation of machine-learning models and their operationalization.

### Food and Agriculture Organization of the United Nations

Rome, Italy

DATA SCIENCE INTERN

Jul. 2019 - Oct. 2019

- Participated in an agile software development teams, building high quality and effective software products that deliver solutions to help FAO to accomplish its Mission focusing on data engineering outputs.
- Developed robust, scalable, automated and reusable data pipelines using cloud native technologies.
- Contributed to the development and evaluation of machine-learning models and their operationalization.

### Upwork.com

FREELANCE MACHINE LEARNING ENGINEER

Mar. 2019 - Present

- Top Rated Freelancer.
- <https://www.upwork.com/o/profiles/users/~018959fe7692de7885/>

## Education

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### University of Science and Technology at Zewail City

Giza, Egypt

BSC. IN COMMUNICATION AND INFORMATION ENGINEERING

Sep. 2015 - Jul. 2020

- merit-based scholarship worth \$50,000

### Udacity

Giza, Egypt

DEEP LEARNING NANODEGREE

Jun. 2019 - Oct. 2019

- <https://confirm.udacity.com/E6GKECG>

## Projects

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### Hand in Hand initiative Geospatial Platform

<http://www.fao.org/hand-in-hand/en>

THE HAND-IN-HAND GEOSPATIAL PLATFORM IS A SUPPORTING TOOL FOR THE HAND-IN-HAND (HiH) INITIATIVE, USING THE MOST SOPHISTICATED TOOLS AVAILABLE, INCLUDING ADVANCED GEO-SPATIAL MODELING AND ANALYTICS TO IDENTIFY THE BIGGEST OPPORTUNITIES TO RAISE THE INCOMES AND REDUCE THE INEQUITIES AND VULNERABILITIES OF RURAL POPULATIONS, WHO CONSTITUTE THE VAST MAJORITY OF THE WORLD'S POOR. THE PLATFORM BRINGS TOGETHER OVER 20 TECHNICAL UNITS FROM MULTIPLE DOMAINS ACROSS FAO. IT LEVERAGES 10+ BACKEND SERVERS, WAREHOUSES AND BIG DATA PIPELINES.

### End to End CNN for self-driving car using multiple data sources

TRAINED A CONVOLUTIONAL NEURAL NETWORK (CNN) TO MAP RAW PIXELS FROM A SINGLE FRONT-FACING CAMERA DIRECTLY TO STEERING COMMANDS. THIS END-TO-END APPROACH PROVED SURPRISINGLY POWERFUL. WITH MINIMUM TRAINING DATA FROM HUMANS THE SYSTEM LEARNS TO DRIVE IN TRAFFIC ON LOCAL ROADS WITH OR WITHOUT LANE MARKINGS AND ON HIGHWAYS.

## Deep RL Quadcopter Controller

DESIGN AND TRAINING OF AN RL AGENT TO CONTROL A QUADCOPTER USING ACTOR-CRITIC RL METHOD.

## Egyptian Banknote classification and detection

TRANSFER LEARNED GOOGLE'S IMAGE RECOGNITION MODEL 'INCEPTION V3' AND 'YOLO V3' TO CLASSIFY AND DETECT DIFFERENT EGYPTIAN BANKNOTES. THE MODELS WERE TRAINED USING A 1600 IMAGES DATA SET THAT WE COLLECTED AND ANNOTATED OURSELVES.

## Other Projects

- A neural Network to solve Linear Programming Problems (LPP)
- Twitter streaming sentiment analysis and analytics
- Nudity Filter using transfer learning on a Convolutional Neural Network model
- CV filtration and extraction tool using NLP and deep learning
- Stock price analysis and prediction using time series analysis
- Movie Recommendation system using clustering
- Chess engine with min-max optimization
- Complete Point of Sale software with SQL support

## Leadership & Awards

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- Apr. 2019 **First Place**, Won the first place nationwide in the United Nations Land and Water hackathon for designing an early flood warning system and testing it on one of the Egyptian cities at risk. *Cairo, Egypt*
- May 2019 **Best Concrete Project**, International Cultural and Academic Meeting of Engineering Students (ICAMES). *Istanbul, Turkey*
- Sept. 2015 **Scholarship**, Awarded a merit-based scholarship to study among 150 students selected nationwide to enroll into the University of Science and technology at Zewail City, the highest ranking university in Egypt according to the times university ranking. *Cairo, Egypt*

## Skills

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• Technical : Java (Proficient) | Python (Proficient) | OpenCV (Competent) | MATLAB (Competent) | Keras (Competent) | TensorFlow (Competent) | C++ (Competent) | Spark (Proficient) | git (Competent) | SQL (Proficient) | NoSQL (Competent) | GCP (Competent) | Firebase (Competent) | Flutter (Novice)

• Personal : Mathematics and Logic | Problem Formulation | Communication | Leadership | Summarizing | Abstraction | Modelling | Presentation

## Extracurricular Activity

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### Zewail City Science Festival (ZCSF)

HEAD OF IT COMMITTEE

- Operated all IT related tasks needed for ZCSF.
- Built the event's website. (<https://www.zewailcitysciencefestival.com>).
- Provided technical support before, during and after the festival to organizers and visitors.

*Giza, Egypt*  
*Mar. 2010 - Sep. 2016*

### IEEE Zewail City student branch (IEEE-ZCSB)

HEAD OF IT AND GRAPHICS COMMITTEE

- Organized events that promote technological literacy.
- Provided graphics for events, banners, Facebook page, and others.
- Participated in the training of Committee members on web technologies

*Giza, Egypt*  
*Oct. 2015 - Sep. 2016*