

## Mohamed Eldesouki (PhD Student)

Curriculum Vitae (last update June 2020)

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### RESEARCH INTERESTS

Natural Language Processing, Machine Learning, Information Retrieval, Question Answering, and Machine Comprehension of Text.

### EXPERIENCE

<i>Research Associate</i> Qatar Computing Research Institute (QCRI), Doha, Qatar	Dec. 2015 - Sep. 2019
<i>Senior Research Software Engineer</i> OMS Company, Cairo, Egypt	Jan. 2015 - Dec. 2015
<i>Senior Research Software Engineer</i> Taya IT Company, Cairo, Egypt	Aug. 2013 - Dec. 2014
<i>Research Engineer</i> MGD Company, Cairo, Egypt	Jul. 2012 - Aug. 2013
<i>Research Assistant</i> Institute of Statistical Studies and Research (ISSR), Cairo University, Cairo, Egypt.	Jul. 2009 - Jun. 2012

### EDUCATION

<b>Master (M.Sc) in Computer Science</b> , Cairo University (Master by Research) - thesis + 3 publications through the Master's period. Rank: Top of my class (with grade 82.2%) Thesis Title: AN INTELLIGENT AGENT FOR ARABIC WEB INFORMATION RETRIEVAL Supervisors: Dr. Kareem Darwish, QCRI/HBKU, Dr. Mervat Gheith, and Dr. Waleed Arafa, Cairo University, Egypt. Specialized in Web Information Retrieval and Web Personalization systems for Arabic language.	Jan. 2012
<b>Postgraduate Diploma in Computer Science</b> , Cairo University	May 2006
<b>Bachelor of Computers and Information</b> , Cairo University Majoring in: Information Systems	May 2003

### ACHIEVEMENTS & RECOGNITION

- I have received a full scholarship from Gina Cody School of Engineering and Computer Science, Concordia University to pursue PhD in Computer Science.
- I have been awarded a Concordia University International Tuition Award of Excellence, valued at approximately \$37,915.00.
- Graduated the first of my class in the Masters program with a final grade of 82%, with a recommendation to complete the PhD.
- I developed an Arabic dialect identification system using features extracted from only the transcripts of a speech recognition system. Using this system, I achieved the **FIRST** place in accuracy and **THIRD** place in F1 among 18 participants in the DSL Shared Task 2016 of the VarDial 2016 workshop for Arabic dialect identification [LINK].
- A "Wikipedian"; an active Wikipedia member who have created and contributed in writing in more than 1800 articles in both Arabic and English Wikipedia projects and Obtained a scholarship to join the *Wikimania Conference in Poland in 2010* [LINK].

## PUBLICATIONS

### 2020

- Kareem Darwish, Mohammed Attia, Hamdy Mubarak, Younes Samih, Ahmed Abdelali, Llus Mrquez, **Mohamed Eldesouki**, Laura Kallmeyer, (2019), *Effective Multi Dialectal Arabic POS Tagging*, Natural Language Engineering, Volume 1, Issue 1, April 2020, Pages 18, doi:10.1017/S1351324920000078. [JOURNAL]

### 2019

- **Mohamed Eldesouki**, Naassih Gopee, Ahmed Ali, Kareem Darwish, (2019), *FarSpeech: Arabic Natural Language Processing for Live Arabic Speech*, In proc. of INTERSPEECH 2019: Show & Tell Contribution, Sep. 2019, Pages 2372-2373, Graz, Austria. [DEMO]
- Younes Samih, Hamdy Mubarak, Ahmed Abdelali, Mohammed Attia, **Mohamed Eldesouki**, Kareem Darwish, (2019), *QC-GO Submission for MADAR Shared Task: Arabic Fine-Grained Dialect Identification*, In proceedings of the Fourth Arabic Natural Language Processing Workshop, Aug. 2019, Pages 290-294. [WORKSHOP]
- Hamdy Mubarak, Ahmed Abdelali, Kareem Darwish, **Mohamed Eldesouki**, Younes Samih, Hassan Sajjad, (2019), *A System for Diacritizing Four Varieties of Arabic*, In proceedings of the EMNLP 2019 and the 9th IJCNLP: System Demonstrations, Nov. 2019, Pages 217-222. [DEMO]
- Salvatore Romeo, Giovanni Da San Martino, Yonatan Belinkov, Alberto Barrón-Cedeño, **Mohamed Eldesouki**, Kareem Darwish, Hamdy Mubarak, James Glass, and Alessandro Moschitti, (2019), *Language Processing and Learning Models for Community Question Answering in Arabic*, Information Processing & Management, Volume 56, Issue 2, March 2019, Pages 274-290. [JOURNAL]

### 2018

- **Mohamed Eldesouki**, Suwon Shon, and Ahmed Ali, James Glass (2018), *QCRI-MIT Live Arabic Dialect Identification System*, QCRI - MIT CSAIL Annual Meeting Qatar National Convention Centre March 27-28, 2018. [POSTER]
- **Mohamed Eldesouki**, Suwon Shon, and Ahmed Ali, (2018), *QCRI-MIT Live Arabic Dialect Identification System*, ICASSP, Calgary, Canada. [DEMO]
- Kareem Darwish, Hamdy Mubarak, **Mohamed Eldesouki**, Ahmed Abdelali, Younes Samih, Randah Alharbi, Mohammed Attia, Walid Magdy, and Laura Kallmeyer, (2018), *Multi-Dialect Arabic POS Tagging: A CRF Approach*, In 11th edition of the Language Resources and Evaluation Conference (LREC), 7-12 May 2018, Miyazaki (Japan).

### 2017

- Younes Samih, **Mohamed Eldesouki**, Mohammed Attia, Kareem Darwish, Ahmed Abdelali, Hamdy Mubarak and Laura Kallmeyer, (2017), *Learning from Relatives: Unified Dialectal Arabic Segmentation*. In Proceedings of the 21st Conference on Computational Natural Language Learning (CoNLL 2017), Vancouver, Canada, 432-441.
- Walid Magdy, and **Mohamed Eldesouky**, (2017), *ClassStrength: A Multilingual Tool for Tweets Classification*, Proc. of the 2017 IEEE/ACM International Conference on Advances in social networks analysis and mining (ASONAM), Sydney, Australia, 593-596.
- **Mohamed Eldesouki**, Younes Samih, Ahmed Abdelali, Mohammed Attia, Hamdy Mubarak, Kareem Darwish and Kallmeyer Laura, (2017), *Arabic Multi-Dialect Segmentation: bi-LSTM-CRF vs. SVM*, <http://arxiv.org/abs/1708.05891>.
- Younes Samih, Mohammed Attia, **Mohamed Eldesouki**, Ahmed Abdelali, Hamdy Mubarak, Laura Kallmeyer and Kareem Darwish, (2017), *A Neural Architecture for Dialectal Arabic Segmentation*. In Proc. of The 3rd Arabic Natural Language Processing Workshop (WANLP-2017) co-located with EACL 2017, Valencia, Spain, pages 46-54.
- Kareem Darwish, Hamdy Mubarak, Ahmed Abdelali and **Mohamed Eldesouki**, (2017), *Arabic POS Tagging: Don't Abandon Feature Engineering Just Yet*, In Proc. of The 3rd Arabic NLP Workshop (WANLP-2017) co-located with EACL 2017, Valencia, Spain, P. 130.

2016

- **Mohamed Eldesouki**, Fahim Dalvi, Hassan Sajjad, and Kareem Darwish, (2016), *QCRI @ DSL 2016: Spoken Arabic Dialect Identification Using Textual Features*, Proc. of the 3rd Workshop on NLP for Similar Languages, Varieties and Dialects, (VarDial 3), Osaka, Japan, P. 221.

2012

- **Mohamed I. Eldesouki**, *An Intelligent Agent for Arabic Web Information Retrieval*, (2012), Master's Thesis, Cairo University.

2011

- **Mohamed Eldesouki**, Waleed Arafa, Kareem Darwish, Mervat H. Gheith, (2011), *Representing Arabic Documents Using Controlled Vocabulary Extracted from Wikipedia*, In Proc. of The 11th Conference on Language Engineering (ESOLEC'11), Cairo, Egypt.
- **Mohamed Eldesouki**, Waleed Arafa, Kareem Darwish, Mervat Gheith, (2011), *Using Wikipedia for Retrieving Arabic Documents*. In Proceedings of Arabic Language Technology International Conference (ALTIC 2011), Alexandria, Egypt.

2009

- **Mohamed I. Eldesouki**, Waleed M. Arafa, Kareem M. Darwish, (2009), *Stemming techniques of Arabic Language: Comparative Study from the Information Retrieval Perspective*, The Egyptian Computer Journal. 36(1):30-49.

## RESEARCH PROJECTS

All the details of the following projects are available in [my website](#) with some demonstrations:

**WISE** (<http://cods.encs.concordia.ca/WISE>) Mar. 2020 - Present  
A scalable natural language platform that provides a unified interface to query RDF-based graphs. WISE proposes a novel three-phase strategy to transform a natural language query into a SPARQL query. Our strategy uses NLP and semantic affinity models trained independently of the targeted RDF graphs, i.e., there is no need for prior knowledge of the graph or redo the preprocessing.

**Farasa Project** (<http://qatsdemo.cloudapp.net/farasa/>) Jan. 2016 - Aug. 2019  
Farasa is a fast and accurate text processing toolkit for Arabic text. Farasa can handle both Modern Standard Arabic (MSA) and the different Arabic dialects. Farasa can perform word segmentation, lemmatization, Part-Of-Speech tagging, text Diacritization, Dependency and constituency Parsing, and spell checking and correction.  
My task in Farasa was to improve Arabic Dialect Segmentation, and Part-Of-Speech tagging. Furthermore, I was responsible for providing annotated data. Using a deep neural architecture of Bidirectional LSTM-CRF, I achieved an average of 93.4% and 92.8% for both segmentation and POS tagging, respectively for 4 Arabic dialects + MSA. [\[more details\]](#)

**Dialectid Project** (<https://dialectid.qcri.org/>) Oct. 2017 - Sep. 2018  
At Qatar Computing Research Institute (QCRI), I have worked in collaboration with MIT CSAIL on the DialectID project that aims to automatic dialect identification in Arabic Broadcast Speech into five Arabic dialects namely; Modern Standard Arabic (MSA), Egyptian dialect, Levantine dialect, Moroccan dialect, and Gulf dialect.  
I built DialectID as an online live identification system for the Arabic speech. The key features of the system I built are: full duplex communication based on websockets, very scalable (+100K users), can do speech segmentation, supports Kaldi's GMM and "online DNN" models, and Python, Java, Javascript clients are available.

**Natasy Deep Learning Lib** (<https://github.com/disooqi/Natasy>) Jun 2017 - Present  
A deep learning library designed and developed to be both easy to use and source code readable. It is a straightforward implementation of different algorithms and techniques of deep learning in Python. You can use it for small projects and/or educational purposes.

I am the main developer of Natasy. I implemented all algorithms from scratch. Natasy supports fully-connected NN, RNN, CNN architectures. I provided implementation for most of the well know functions and algorithms (+25) for activation, initialization, optimization, dropout, ...

**Buzzdiggr project** (<http://www.buzzdiggr.com/>) Jan. 2015 - Dec. 2015  
buzzdiggr is a real-time monitoring platform that listens to social media platforms and the web for mentions of commercial brands then provides an array of powerful features for analysis.

I was responsible to transfer and maintain the state-of-the-art science and technologies in the field of Topic detection, Named-entity Recognition, Sentiment analysis, and Arabic Dialects Identifications where, 1) I have provide the dataset for building Sentiment Analyzer, Named-Entity Recognizer, and dialect identification, and 2) I have conducting research building both Sentiment Analyzer and Named-Entity Recognizer.

**Taya Arabic Processing Suite project** Aug. 2013 - Dec. 2014  
A multi-purpose Arabic processing port which facilitates Arabic language analysis through advanced tools and techniques, TAPS is designed to adapt and adjust to all search engines. Some of the key features of TAP are Morphology Analyzes, Named Entities Recognition, Keyboard Layout Detection/Correction, Spell Correction, Language Identification, Dynamic Document Clustering, and Text Summarization.

I worked on TAPS project from May 2013 until September 2014 (1 year and half) while I was a Senior Research Engineer in collaboration with Dr. Ossam Emam at Taya IT company. I built the named-entity recognition and the spellcheck error detection & correction, and auto-completion.

**MGD Intelligent Tutoring System** Jul. 2012 - Aug. 2013  
An Intelligent tutoring systems (ITS) that can assist human teachers identify the weakness of their students in different Math skills (addition, subtraction, multiplications, etc) and then suggests a tailored strategic path of exercises to strengthen these skills for the students.

**ArabAgent Project** Jan 2009 - Apr 2013  
A content-based recommendation system that is used to help the user customizing his or her access to the Web based on his interests and preferences that have been gleaned from his activities over the internet. The customization is done through filtering news articles and personalizing web search.  
ArabAgent project is my Master Research Project. I worked on it during my master period and I continued working on it 2 years after I earned the degree.

**TECHNOLOGY** Proficient and familiar with a vast array of programming languages, concepts and technologies, including:

**Programming Languages:**  
Proficient in Python, C/C++, Java, Prolog and Lisp and familiar with C# .NET and PHP.

**Databases:** *Relational DBs*; MySQL, MS SQL server 2012 PostgreSQL. *NoSQL DBs*; MongoDB, Neo4j, Redis.

**Machine learning & Scientific packages;** Tensorflow, Keras, Scikit-learn, Octave, NumPy, SciPy, matplotlib, Jupyter notebook, CRF++, YASMET, YamCha.

**NLP & IR packages;** NLTK, Indri (Lemur project), Solr (Lucene), FARASA toolkit, MADAMIRA, SRILM (SRI Language Model), Kaldi.

**Technologies and Tools:** *Web Platforms:* Java EE, Django, and Flask  
*Web Frontend Technologies:* HTML, XHTML, CSS, JavaScript, HTML DOM, Ajax, XML, XML DOM, Web sevice, JSON and Bootstrap framework.  
*Other tech.:* Git, conda, virtual environment, virtual machines, Docker, Python Packaging.

OS Platforms: Linux, Windows, Mac

#### **OTHER ACTIVITIES**

- Reviewing for: ACL 2018, BJIT, RANLP 2017 <http://lml.bas.bg/ranlp2017/pc.php>,
- Continuing Education: Achieved several certificates through MOOC courses including machine learning, deep learning, and General AI<sup>1</sup>.

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<sup>1</sup>For the full list of certificates please visit my linkedIn profile <https://www.linkedin.com/in/disooqi/> and look for Accomplishments-Certifications section