

Badr ALKHAMISSI

AI Researcher

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I am passionate about building sample efficient intelligent systems that can solve complex machine learning tasks and at the same time reveal insights about the inner workings of biological agents. Such systems do not only pave a way for solving long-standing societal problems but also shed light on what it means to be human. Please see [website](#) for a more detailed resumé.

EDUCATION

September 2020	Goldsmiths, University of London, MASTER OF SCIENCE, London, UK
September 2019	<ul style="list-style-type: none">➤ MSc. in Computational Cognitive Neuroscience - Pass with Distinction.➤ Thesis: Episodic Meta-Reinforcement Learning on the Two-Step and Harlow Tasks (Grade: 90%).
June 2018	The American University in Cairo, BACHELOR OF SCIENCE, Cairo, Egypt
September 2014	<ul style="list-style-type: none">➤ BSc. in Computer Science - Summa Cum Laude. GPA 4.0➤ President's Cup and Mohamed El Beledy Academic Award for class valedictorian.➤ Mohammed Bin Abdulkarim A. Allehedan Award for highest performing STEM student.➤ Academic Achievement Scholarship.➤ Thesis: Video Search using Natural Language.
July 2017	Tsinghua University, DEEP LEARNING SUMMER SCHOOL, Beijing, China
	<ul style="list-style-type: none">➤ Thorough training in deep learning, covering many applications in Computer Vision, NLP, Knowledge Graph, Social Media Analysis, Multimodal Analysis and Robotics.➤ Outstanding Performance Award in Deep Learning Summer School at Tsinghua University.
December 2016	Stony Brook University, SEMESTER ABROAD, New York, United States
August 2016	<ul style="list-style-type: none">➤ Best Junior Award in Stony Brook ACM Regional Qualification Contest.➤ Abdallah Jum'ah Study Abroad Scholarship.
June 2014	Manor House School, INTERNATIONAL GENERAL CERTIFICATE OF SECONDARY EDUCATION, Cairo, Egypt
September 2011	<ul style="list-style-type: none">➤ Outstanding Cambridge Learner Award in AI Computing.

RESEARCH AND INDUSTRIAL EXPERIENCE

Present	AI Resident, META AI, Seattle, US
November 2021	<ul style="list-style-type: none">➤ Conducting Research in NLP. Written 6 first-author papers so far. (See Publications) <div>NLP Hate Speech Responsible AI Reasoning Arabic NLP FAIR</div>
October 2021	Research Intern, SONY AI, Tokyo, Japan (Remotely)
March 2021	<ul style="list-style-type: none">➤ Published 2 papers in collaboration with DeepMind and 1 paper with Sony CSL. (See Publications) <div>Meta-learning Reinforcement learning Symbolic Alchemy</div>
September 2019	Applied Scientist, MICROSOFT ADVANCED TECHNOLOGY LAB IN CAIRO, Cairo, Egypt
April 2019	<ul style="list-style-type: none">➤ Part of the LUIS Applied Science Team and the Machine Teaching Innovation Group.➤ Research in Cross-Lingual Model Transfer.➤ Best Mentor Award.➤ First Place in MS ATLCL Hackathon. <div>NLU NLP MT Keras Tensorflow PyTorch Python C#</div>
March 2019	Machine Intelligence Researcher, VKANSEE, Cairo, Egypt
January 2018	<ul style="list-style-type: none">➤ Research in fingerprint matching, spoofing and quality analysis through deep learning.➤ Optimize implementations for speed and space to suit embedded devices with restricted resources. <div>Computer Vision Few-Shot Learning Keras Tensorflow Python C++ QT</div>
September 2018	Software Engineer, MICROSOFT ADVANCED TECHNOLOGY LAB IN CAIRO, Cairo, Egypt
June 2018	<ul style="list-style-type: none">➤ Researching the applicability of multilingual bot-interaction through Machine Translation.➤ Mentoring Summer Intern.➤ Developed Node CLI tool for MS Language Generation, part of Bot-Framework tools.➤ Incorporate Machine Translation into MS Bot-Framework. <div>Visual Studio C# NodeJS JavaScript TypeScript Python .NET MT</div>

Fall '15 & '17
& Spring '16

Undergraduate Teaching Assistant, THE AMERICAN UNIVERSITY IN CAIRO, Cairo, Egypt

- › Teaching assistant for Deep Learning and Programming Fundamentals courses.
- › Hold regular office hours to help students.
- › Give sessions and workshops to assist students with their coursework.

C++ Python Tensorflow Keras SFML

Winter '16
& Summer '15

Software Development Engineer Intern, MICROSOFT ADVANCED TECHNOLOGY LAB IN CAIRO, Cairo, Egypt

- › Supporting full-text search for MS Language Understanding Intelligent Service (LUIS) utterances.
- › Migrating existing LUIS database from Azure to MS SQL Server and adjusting LUIS features that uses this database accordingly.
- › Design and implement the application import/export feature on LUIS.
- › Developing different applications (iOS, Windows Phone and an Office Extension) that utilizes LUIS.

C# F# Swift Objective-C iOS Windows Phone .NET Visual Studio Xcode

PUBLICATIONS & CONFERENCES

OPT-R: FINETUNED LANGUAGE MODELS ON EXPLANATIONS ARE BETTER FEW-SHOT REASONERS UNDER PREPARATION FOR TACL

Under Preparation

Measuring the contribution of explanations when meta-finetuning large language models of different scales on eight reasoning datasets.

First Author NLP Reasoning Meta AI

ARAPOET: CONTROLLED ARABIC POETRY GENERATION WITH A TWIST

IN SUBMISSION

 [Paper](#)

Finetuning a monolingual Arabic model and a multilingual one then combining them at decode time for controlled poetry generation.

First Author NLP Creative AI Meta AI

TOKEN: TASK DECOMPOSITION AND KNOWLEDGE INFUSION FOR FEW-SHOT HATE SPEECH DETECTION ACCEPTED AT EMNLP 2022

 [Paper](#)

Few-shot Hate Speech detection through task decomposition and knowledge infusion that is more generalizable and robust.

First Author Oral Presentation Hate Speech NLP Efficient NLP Responsible AI Meta AI

DEPTH-WISE ATTENTION (DWATT): A LAYER FUSION METHOD FOR DATA-EFFICIENT CLASSIFICATION

ACCEPTED AT

NEURIPS/ENLSP 2022

 [Paper](#)  [Poster](#)

Few-shot Hate Speech detection through task decomposition and knowledge infusion that is more generalizable and robust.

First Author Poster Presentation NLP Efficient NLP Meta AI

META AI AT ARABIC HATE SPEECH 2022: MULTITASK LEARNING WITH SELF-CORRECTION FOR HATE SPEECH CLASSIFICATION ACCEPTED AT OSACT5/LREC 2022

 [Paper](#)  [Best Paper Award](#)  [Tweets](#)

We tackle the Arabic Fine-Grained Hate Speech Detection shared task and demonstrate significant improvements over reported baselines for its three subtasks.

First Author Oral Presentation Best Paper Hate Speech NLP ArabicNLP Responsible AI Meta AI

A REVIEW OF LANGUAGE MODELS AS KNOWLEDGE BASES

UNDER REVIEW 2022

 [Paper](#)  [Tweets](#)

We present a set of aspects that we deem a LM should have to fully act as a KB, and review the recent literature with respect to those aspects.

First Author Survey NLP Meta AI

EPIPHENOMENAL REPRESENTATIONS OF ABSTRACT RULES IN A CONNECTIONIST MODEL OF THE DELAYED MATCH TO SAMPLE TASK ACCEPTED AT COSYNE 2022

 [Paper](#)  [Poster](#)

We show that abstract rule representations do not guide a biologically inspired artificial agent in solving the DMS task.

First Author CogSci Neuroscience Sony AI DeepMind

HOW TO LEARN AND REPRESENT ABSTRACTIONS: AN INVESTIGATION USING SYMBOLIC ALCHEMY ACCEPTED AT AUTOML/AUTOML 2022

 [Paper](#)  [Poster](#)

First steps toward using Symbolic Alchemy to identify design choices that enable agents to learn various types of abstraction.

First Author Meta-RL Neuroscience Sony AI DeepMind

[Paper](#) [Poster](#)

We analyze the reinstatement mechanism introduced by Ritter et al. (2018) to reveal two classes of neurons that emerge in the agent's working memory (an epLSTM cell) when trained using episodic meta-RL.

First Author Spotlight Meta-RL Neuroscience Sony AI DeepMind

ADAPTING MARBERT FOR IMPROVED ARABIC DIALECT IDENTIFICATION

ACCEPTED AT EACL/WANLP 2021

[Paper](#) [Demo](#) [Poster](#) github.com/mohamedgabr96/NeuralDialectDetector

We tackle the second Nuanced Arabic Dialect Identification (NADI) shared task and succeed in achieving state-of-the-art results on all of its four subtasks.

First Author Oral Presentation ArabicNLP NLP

DEEP DIACRITIZATION: EFFICIENT HIERARCHICAL RECURRENCE FOR IMPROVED ARABIC DIACRITIZATION

COLING/WANLP 2020

[Paper](#) [Demo](#) github.com/bkhmsi/deep-diacritization

We propose a novel architecture for automatically restoring Arabic diacritics that outperforms previous SOTA methods.

First Author Oral Presentation Main Paper ArabicNLP NLP

DEEP SPIKING NEURAL NETWORKS WITH RESONATE-AND-FIRE NEURONS

PREPRINT

[Paper](#)

We explore a new Spiking Neural Network (SNN) formulation with Resonate-and-Fire neurons (RAF).

First Author Neuroscience SNN

PROGRAM COMMITTEE MEMBER (REVIEWER)

ENLSP Workshop at NeurIPS 2022. Language Modeling and Analysis of Language Models Track at EMNLP 2022. Main Track and Late-Breaking Workshop at AutoML 2022. I (Still) Can't Believe It's Not Better! Workshop at NeurIPS 2021. Meta-Learn Workshop at NeurIPS 2021. Learning to Learn Workshop at ICLR 2021. Meta Learn Workshop at NeurIPS 2020.

ORAL PRESENTATION

EMNLP 2022. MemARI at NeurIPS 2022. OSACT5 at LREC 2022. WANLP at EACL 2021. WANLP at COLING 2020.

POSTER PRESENTATION

ENLSP at NeurIPS 2022. AutoML Workshop at AutoML 2022. Learning to Learn at ICLR 2021.

SELECTED PROJECTS

EPISODIC META-RL ON THE TWO-STEP AND HARLOW TASKS

JUNE 2020 - AUGUST 2020

[Blog Post](#) github.com/bkhmsi/Meta-RL-TwoStep-Task github.com/bkhmsi/Meta-RL-Harlow

MSc. Dissertation. Reproduces the results of animal behavior and artificial agents on both the Two-Step and Harlow tasks using an episodic meta-RL model that combines 3 RL systems inspired from the machine learning and neuroscience literature.

Python PyTorch Meta-RL RL EMRL Neuroscience

VIDEO SEGMENT RETRIEVAL BY TEXT QUERIES

SEPTEMBER 2017 - MAY 2018

[Video](#) [Poster](#) github.com/bkhmsi/forget-me-not

Undergraduate Thesis Project. Proposes a framework for searching long untrimmed videos for segments that logically correlate with a natural language query.

Python PyTorch Tensorflow Keras Computer Vision NLP

SKETCH INVERSION USING DEEP CONVOLUTIONAL NEURAL NETWORKS

MAY 2017

[Poster](#) github.com/bkhmsi/sketchback

Synthesising photo-realistic images from pencil sketches of human faces and architectural drawings of buildings.

Python Tensorflow Keras Computer Vision

KORASTAK.COM

JUNE 2016 - PRESENT

korastak.com

Notes-sharing platform with the goal of democratizing the studying experience for students in Egyptian universities.

NodeJS AngularJS Firebase HTML CSS

LANGUAGES

Arabic	●	●	●	●	●
English	●	●	●	●	●
French	●	●	○	○	○

SKILLS

Proficient	Python, PyTorch, TF, Keras, C++, JS, NodeJS, C#, Java, SQL, Matlab, HTML, CSS
Prior Exp	Swift, Obj-C, F#, Elm, VB, PHP, Verilog, Ruby, iOS Dev, Android Dev, Windows Phone Dev, Alexa Dev, Unity, Arduino

OTHER AWARDS

- Best Paper Award for the Fine-Grained Hate Speech Detection Shared Task in Arabic.
- First place in all four categories of the second NADI shared task. '21
- Dean's list from Fall '14 till Spring '18 - The American University in Cairo '14 - '18
- Computer Science Exemplary Student - The American University in Cairo '18
- Highest-GPA Award for Expected to Graduate - The American University in Cairo '18
- Shortlisted in Dell EMC's Graduation Project Competition - The American University in Cairo '18
- Third Place Amazon Innovation Hackathon - The American University in Cairo '18
- Highest-GPA Award for Juniors - The American University in Cairo '17
- Second Prize in Amazon Alexa Hackathon - The American University in Cairo '17
- High Achiever in CS1101 Course - The American University in Cairo '15

ACTIVITIES AND VOLUNTEERING

- Gave a talk at the Goldsmiths Computational Cognitive Neuroscience Career Event.
- Led website development track for the ACL-6060 D&I Initiative.
- Official Author of Towards Data Science.
- Volunteered in the organization of the 28th International Conference on Computational Linguistics (COLING'2020).
- Participated in giving a tutorial on multilingual embeddings at IndabaX'19 Egypt.
- Participated in several competitive programming contests including Google Hash Code, Facebook Hacker Cup and more. Qualified to ACM ECPC representing AUC, June '15 - June '18.
- Associate Head of the Computer Science and Engineering Association academics. committee at AUC, responsible for organizing academic events and workshops, Spring '17
- Co-Founded Creative Coding Cairo under FabLab Egypt. Organize monthly meet-ups for the community, Juyl '16 - Sep '17.
- Developed a Database System for Doum Cultural Foundation using MS Access VB and SQL. Managing their website and their digital presence. Volunteer in organizing some of their workshops and cultural events, Cairo, September '12 - May '16.
- Member of the CISV Egyptian delegation. Participated in organizing a summer camp in Paris, June '10.
- A member of the children jury delegation of long and short films in Cairo International Film Festival for Children; our role was to select a winner for each prize in the film festival, '07, '08, '10.