

# Badr ALKHAMISSI

## PhD Candidate at EPFL

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https://bkhmsi.github.io github.com/bkhmsi linkedin.com/in/bkhmsi scholar.google.com/bkhmsi

I am passionate about building 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

Present September 2023	<b>EPFL, PhD, Lausanne, Switzerland</b> <ul style="list-style-type: none"><li>Co-advised by Antoine Bosselut (NLP Lab) and Martin Schrimpf (NeuroAI Lab).</li></ul>
September 2020 September 2019	<b>Goldsmiths, University of London, MASTER OF SCIENCE, London, UK</b> <ul style="list-style-type: none"><li>MSc. in Computational Cognitive Neuroscience - Pass with Distinction.</li><li>Thesis: Episodic Meta-Reinforcement Learning on the Two-Step and Harlow Tasks (Grade: 90%).</li></ul>
June 2018 September 2014	<b>The American University in Cairo, BACHELOR OF SCIENCE, Cairo, Egypt</b> <ul style="list-style-type: none"><li>BSc. in Computer Science - Summa Cum Laude. <b>GPA 4.0</b></li><li>Thesis: Video Search via Natural Language.</li></ul>
July 2017	<b>Tsinghua University, DEEP LEARNING SUMMER SCHOOL, Beijing, China</b> <ul style="list-style-type: none"><li>Training in deep learning, covering applications in Vision, NLP, Knowledge Graph, and Robotics.</li></ul>
December 2016 August 2016	<b>Stony Brook University, SEMESTER ABROAD, New York, United States</b> <ul style="list-style-type: none"><li>Coursework included Computer Vision, Artificial Intelligence, and Analysis of Algorithms.</li></ul>

## SELECTED RESEARCH AND INDUSTRIAL EXPERIENCE

November 2022 November 2021	<b>AI Resident, META AI, Seattle, US</b> <ul style="list-style-type: none"><li>Research in NLP. Published 5 first-author papers, and 1 co-author paper. (See Publications)</li></ul> <div>NLP Hate Speech Responsible AI Reasoning Arabic NLP FAIR</div>
October 2021 October 2020	<b>Research Intern, SONY AI, Tokyo, Japan (Remotely)</b> <ul style="list-style-type: none"><li>Published 2 papers in collaboration with DeepMind and 1 paper with Sony CSL. (See Publications)</li></ul> <div>Meta-learning Reinforcement Learning Symbolic Alchemy</div>
September 2019 April 2019	<b>Applied Scientist, MICROSOFT ADVANCED TECHNOLOGY LAB IN CAIRO, Cairo, Egypt</b> <ul style="list-style-type: none"><li>Part of the LUIS Applied Science Team and the Machine Teaching Innovation Group.</li></ul> <div>NLU NLP MT Keras Tensorflow PyTorch Python C#</div>
March 2019 January 2018	<b>Machine Intelligence Researcher, VKANSEE, Cairo, Egypt</b> <ul style="list-style-type: none"><li>Research in fingerprint matching, spoofing and quality analysis through deep learning.</li></ul> <div>Computer Vision Few-Shot Learning Keras Tensorflow Python C++ QT</div>

## SELECTED AWARDS

- EPFL Doc.Mobility Grant Recipient. '25
- President's Cup and Mohamed El Beledy Academic Award for class valedictorian - American University in Cairo '18.
- Mohammed Bin Abdulkarim A. Allehedan Award for highest performing STEM student - American University in Cairo '18.
- First place on the two categories of the Arabic Reverse Dictionary shared task at ArabicNLP 2023. '23
- Best Paper Award for the Fine-Grained Hate Speech Detection shared task in Arabic. '22
- First place in all four categories of the second NADI shared task. '21
- Best Mentor Award at Microsoft Advanced Technology Lab in Cairo. '19
- Shortlisted in Dell EMC's Graduation Project Competition - American University in Cairo '18
- Computer Science Exemplary Student - American University in Cairo '18
- Outstanding Performance Award in Deep Learning Summer School at Tsinghua University. '17
- Best Junior Award in Stony Brook ACM Regional Qualification Contest. '16
- Abdallah Jum'ah Study Abroad Scholarship. '16

Spring '24 & '25 & Fall '24	<b>Teaching Assistant, EPFL, Lausanne, Switzerland</b> > Teaching assistant for Modern Natural Language Processing and Linear Algebra. Python PyTorch NLP LLMs RLHF
May 2019	<b>Tutorial, INDABAX EGYPT, Cairo, Egypt</b> > Jointly led a tutorial on cross-lingual alignment at IndabaX Egypt. Python PyTorch Multilingual NLP LLMs
Fall '15 & '17 & Spring '16	<b>Undergraduate Teaching Assistant, THE AMERICAN UNIVERSITY IN CAIRO, Cairo, Egypt</b> > Teaching assistant for Deep Learning and Programming Fundamentals courses. C++ Python Tensorflow Keras SFML

## SELECTED PUBLICATIONS

### Preprints

<b>APERTUS: DEMOCRATIZING OPEN AND COMPLIANT LLMs FOR GLOBAL LANGUAGE ENVIRONMENTS</b> <a href="#">Paper</a> <a href="#">Media</a> <a href="#">Models</a> <a href="#">Tweets</a> Authors: Alejandro Hernández-Cano, Alexander Hägele, [...], <b>Badr Alkhamissi</b> , [...], Antoine Bosselut*, Imanol Schlag*, Martin Jaggi*	PREPRINT
<b>MIXTURE OF COGNITIVE REASONERS: MODULAR REASONING WITH BRAIN-LIKE SPECIALIZATION</b> <a href="#">Paper</a> <a href="#">Website</a> <a href="#">Tweets</a> <a href="https://github.com/bkhmsi/mixture-of-cognitive-reasoners">github.com/https://github.com/bkhmsi/mixture-of-cognitive-reasoners</a> Authors: <b>Badr Alkhamissi</b> , C. Nicolò De Sabbata, Zeming Chen, Martin Schrimpf*, Antoine Bosselut*	UNDER REVIEW
<b>RATIONAL METAREASONING FOR LARGE LANGUAGE MODELS</b> <a href="#">Paper</a> Authors: C. Nicolò De Sabbata, Theodore R. Sumers, <b>Badr Alkhamissi</b> , Antoine Bosselut, Thomas L. Griffiths	UNDER REVIEW
<b>MEDITRON: OPEN MEDICAL FOUNDATION MODELS ADAPTED FOR CLINICAL PRACTICE</b> <a href="#">Paper</a> <a href="https://github.com/epfLLM/meditron">github.com/https://github.com/epfLLM/meditron</a> Authors: Zeming Chen, Angelika Romanou*, Antoine Bonnet*, Alejandro Hernández-Cano*, <b>Badr Alkhamissi*</b> , Kyle Matoba*, [...], Physician Evaluation Group, Noémie Boillat-Blanco, Kristina Keitel, Javier Elkin, Blaise Robert, Syrielle Montariol, Mary-Anne Hartley*, Martin Jaggi*, Antoine Bosselut*	UNDER REVIEW
<b>A REVIEW OF LANGUAGE MODELS AS KNOWLEDGE BASES</b> <a href="#">Paper</a> <a href="#">Website</a> <a href="#">Tweets</a> Authors: <b>Badr Alkhamissi*</b> , Millicent Li*, Asli Celikyilmaz, Mona Diab, Marjan Ghazvininejad	PREPRINT 2022

### Conferences

<b>FROM LANGUAGE TO COGNITION: HOW LLMs OUTGROW THE HUMAN LANGUAGE NETWORK</b> <a href="#">Paper</a> <a href="#">Tweets</a> Authors: <b>Badr Alkhamissi</b> , Greta Tuckute, Yingtian Tang, Taha Binhuraib, Antoine Bosselut*, Martin Schrimpf*	EMNLP 2025
<b>THE LLM LANGUAGE NETWORK: A NEUROSCIENTIFIC APPROACH FOR IDENTIFYING CAUSALLY IMPORTANT UNITS</b> <b>Oral</b> <a href="#">Paper</a> <a href="#">Website</a> <a href="https://github.com/bkhmsi/llm-localization">github.com/https://github.com/bkhmsi/llm-localization</a> Authors: <b>Badr Alkhamissi</b> , Greta Tuckute, Antoine Bosselut*, Martin Schrimpf*	NAACL 2025
<b>TOPOLM: BRAIN-LIKE SPATIO-FUNCTIONAL ORGANIZATION IN A TOPOGRAPHIC LANGUAGE MODEL</b> <b>Oral</b> <a href="#">Paper</a> <a href="#">Tweets</a> Authors: Neil Rathi*, Johannes Mehrer*, <b>Badr Alkhamissi</b> , Taha Binhuraib, Nicholas M. Blauch, Martin Schrimpf	ICLR 2025
<b>INVESTIGATING CULTURAL ALIGNMENT OF LARGE LANGUAGE MODELS</b> <a href="#">Paper</a> <a href="#">Tweets</a> <a href="https://github.com/bkhmsi/cultural-trends">github.com/https://github.com/bkhmsi/cultural-trends</a> Authors: <b>Badr Alkhamissi</b> , Muhammad ElNokrashy, Mai Alkhamissi, Mona Diab	ACL 2024
<b>A CONTEXT-CONTRASTIVE INFERENCE APPROACH TO PARTIAL DIACRITIZATION</b> <b>Oral</b> <a href="#">Paper</a> <a href="#">Demo</a> <a href="https://github.com/munael/ccpd-partial-arabic-diacritization">github.com/https://github.com/munael/ccpd-partial-arabic-diacritization</a> Authors: Muhammad ElNokrashy, <b>Badr Alkhamissi</b>	ARABICNLP 2024
<b>INSTRUCTION-TUNING ALIGNS LLMs TO THE HUMAN BRAIN</b> <a href="#">Paper</a> <a href="#">Tweets</a> Authors: Khai Loong Aw, Syrielle Montariol*, <b>Badr Alkhamissi*</b> , Martin Schrimpf, Antoine Bosselut	COLM 2024
<b>DEPTH-WISE ATTENTION (DWATT): A LAYER FUSION METHOD FOR DATA-EFFICIENT CLASSIFICATION</b> <b>Oral</b> <a href="#">Paper</a> <a href="#">Poster</a> Authors: Muhammad ElNokrashy*, <b>Badr Alkhamissi*</b> , Mona Diab	LREC-COLING 2024

## “FLEX TAPE CAN’T FIX THAT”: BIAS AND MISINFORMATION IN EDITED LANGUAGE MODELS

EMNLP 2024

[Paper](#)

Authors: Karina Halevy, Anna Sotnikova, **Badr AlKhamissi**, Syrielle Montariol, Antoine Bosselut

## ALERT: ADAPT LANGUAGE MODELS TO REASONING TASKS

ACL 2023

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

Authors: Ping Yu, Tianlu Wang, Olga Golovneva, **Badr AlKhamissi**, Siddharth Verma, Zhijing Jin, Gargi Ghosh, Mona Diab, Asli Celikyilmaz

## TOKEN: TASK DECOMPOSITION AND KNOWLEDGE INFUSION FOR FEW-SHOT HATE SPEECH DETECTION

EMNLP 2022

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

Authors: **Badr AlKhamissi**\*, Faisal Ladhak\*, Srini Iyer, Ves Stoyanov, Zornitsa Kozareva, Xian Li, Pascale Fung, Lambert Mathias, Asli Celikyilmaz, Mona Diab

## Workshops

### A SELF-SYNTHESIS APPROACH FOR TRAINING VISION-LANGUAGE MODELS WITH DEVELOPMENTALLY PLAUSIBLE DATA BABYLM 2024

CoNLL 2024 [Paper](#)

Authors: **Badr AlKhamissi**\*, Yingtian Tang\*, Abdülkadir Gökçe\*, Johannes Mehrer, Martin Schrimpf

### KHATTAT: ENHANCING READABILITY AND CONCEPT REPRESENTATION OF SEMANTIC TYPOGRAPHY

AI4VA 2024

ECCV 2024 [Paper](#) [Website](#) [Tweets](#)

Authors: Ahmed Hussein\*, Alaa Elsetohy\*, Sama Hadhoud\*, Tameem Bakr\*, Yasser Rohaim\*, **Badr AlKhamissi**

### OPT-R: EXPLORING THE ROLE OF EXPLANATIONS IN FINETUNING AND PROMPTING FOR REASONING SKILLS OF LLMs NLRSE 2023

ACL 2023 [Paper](#) [Poster](#) [Tweets](#)

Authors: **Badr AlKhamissi**, Siddharth Verma, Ping Yu, Zhijing Jin, Asli Celikyilmaz, Mona Diab

### MULTITASK LEARNING WITH SELF-CORRECTION FOR HATE SPEECH CLASSIFICATION

OSACT5 2022

LREC 2022 [Oral](#) [Paper](#) [Best Paper Award](#) [Tweets](#)

Authors: **Badr AlKhamissi**\*, Mona Diab

### HOW TO LEARN AND REPRESENT ABSTRACTIONS: AN INVESTIGATION USING SYMBOLIC ALCHEMY

AUTOML WORKSHOP 2022

AutoML 2022 [Paper](#) [Poster](#) [github.com/https://github.com/BKHMSI/alchemist](https://github.com/BKHMSI/alchemist)

Authors: **Badr AlKhamissi**, Akshay Srinivasan, Zeb Kurth-Nelson, Sam Ritter

### THE EMERGENCE OF ABSTRACT AND EPISODIC NEURONS IN EPISODIC META-RL

MEMARI 2022

NeurIPS 2022 [Spotlight](#) [Oral](#) [Paper](#) [Poster](#)

Authors: **Badr AlKhamissi**, Muhammad ElNokrashy, Michael Spranger

### DEEP DIACRITIZATION: EFFICIENT HIERARCHICAL RECURRENCE FOR IMPROVED ARABIC DIACRITIZATION

ARABICNLP 2020

COLING 2020 [Paper](#) [github.com/https://github.com/BKHMSI/deep-diacritization](https://github.com/BKHMSI/deep-diacritization)

Authors: [Oral](#) **Badr AlKhamissi**, Muhammad ElNokrashy, Mohamed Gabr

## SELECTED INVITED TALKS

- › LauzHack Deep Learning Bootcamp: Brain-Inspired Large Language Models.
- › Psychology Days at Riga Stradins University: Vision and Language in Brains, Minds and Machines.
- › Ev Fedorenko’s Language Lab at MIT: Brain Alignment of Untrained Models.
- › NCCR Evolving Language Group: Brain Alignment of Untrained Models.
- › Cohere For AI Community Talk (Geo Regional Africa Group): Investigating Cultural Alignment of LLMs.
- › ARBML Board Talk: Investigating Cultural Alignment of LLMs.
- › AiBelmasry Podcast (Guest Speaker): Analyzing LLM’s Ability in Reasoning.
- › TEDxMIU Talk: Representation Matters: Celebrating Egyptians in the AI Revolution.
- › Cohere For AI Community Talk: Presenting OPT-R Paper.
- › Mada Masr Podcast Guest Speaker (April 6th 2023 Episode): A New World Shaped by Artificial Stupidity.
- › Egyptian Association for Globalization and Language Solutions (Keynote Speaker): Challenges and Opportunities of AI.
- › Goldsmiths, University of London Career Event: Opportunities for Computational Cognitive Neuroscience Graduates.

## SERVICE

### ORGANIZING COMMITTEE

ArabicNLP 2025 (Publicity Chair). ICML Workshop on Large Languages and Cognition (2024). ArabicNLP 2024 (Social Chair).

### SELECTED PROGRAM COMMITTEE MEMBER (REVIEWER)

NeurIPS 2025. EMNLP 2025. ACL 2025. NAACL 2025 (Area Chair). EMNLP 2024. NeurIPS 2024. ArabicNLP 2024. Cognitive Computational Neuroscience (CCN) 2024. ACL 2024. NAACL 2024. EMNLP 2023. ACL 2023. ENLSP-II Workshop at NeurIPS 2022. 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, 2020. Learning to Learn Workshop at ICLR 2021.