Badr ALKHAMISSI
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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	**EPFL, PHD, Lausanne, Switzerland** > Co-advised by Antoine Bosselut (NLP Lab) and Martin Schrimpf (NeuroAI Lab).
September 2020 September 2019	**Goldsmiths, University of London, MASTER OF SCIENCE, London, UK** > MSc. in Computational Cognitive Neuroscience - Pass with Distinction. > Thesis: Episodic Meta-Reinforcement Learning on the Two-Step and Harlow Tasks (Grade: 90%).
June 2018 September 2014	**The American University in Cairo, BACHELOR OF SCIENCE, Cairo, Egypt** > BSc. in Computer Science - Summa Cum Laude. **GPA 4.0** > Thesis: Video Search via Natural Language.
July 2017	**Tsinghua University, DEEP LEARNING SUMMER SCHOOL, Beijing, China** > Training in deep learning, covering applications in Vision, NLP, Knowledge Graph, and Robotics.
December 2016 August 2016	**Stony Brook University, SEMESTER ABROAD, New York, United States** > Coursework included Computer Vision, Artificial Intelligence, and Analysis of Algorithms.

SELECTED RESEARCH AND INDUSTRIAL EXPERIENCE

November 2022 November 2021	**AI Resident, META AI, Seattle, US** > Research in NLP. Published 5 first-author papers, and 1 co-author paper. (See Publications) `NLP` `Hate Speech` `Responsible AI` `Reasoning` `Arabic NLP` `FAIR`
October 2021 October 2020	**Research Intern, SONY AI, Tokyo, Japan (Remotely)** > Published 2 papers in collaboration with DeepMind and 1 paper with Sony CSL. (See Publications) `Meta-learning` `Reinforcement Learning` `Symbolic Alchemy`
September 2019 April 2019	**Applied Scientist, MICROSOFT ADVANCED TECHNOLOGY LAB IN CAIRO, Cairo, Egypt** > Part of the LUIS Applied Science Team and the Machine Teaching Innovation Group. `NLU` `NLP` `MT` `Keras` `Tensorflow` `PyTorch` `Python` `C#`
March 2019 January 2018	**Machine Intelligence Researcher, VKANSEE, Cairo, Egypt** > Research in fingerprint matching, spoofing and quality analysis through deep learning. `Computer Vision` `Few-Shot Learning` `Keras` `Tensorflow` `Python` `C++` `QT`

SELECTED AWARDS

> **EPFL Doc.Mobility Grant** Recipient. '25
> **President's Cup** and **Mohamed El Beleidy 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

💼 TEACHING EXPERIENCE

Spring '24 & '25 & Fall '24 | **Teaching Assistant, EPFL, Lausanne, Switzerland**
> Teaching assistant for Modern Natural Language Processing and Linear Algebra.

`Python` `PyTorch` `NLP` `LLMs` `RLHF`

May 2019 | **Tutorial, INDABAX EGYPT, Cairo, Egypt**
> Jointly led a tutorial on cross-lingual alignment at IndabaX Egypt.

`Python` `PyTorch` `Multilingual NLP` `LLMs`

Fall '15 & '17 & Spring '16 | **Undergraduate Teaching Assistant, THE AMERICAN UNIVERSITY IN CAIRO, Cairo, Egypt**
> Teaching assistant for Deep Learning and Programming Fundamentals courses.

`C++` `Python` `Tensorflow` `Keras` `SFML`

📘 SELECTED PUBLICATIONS

Preprints

MIXTURE OF COGNITIVE REASONERS: MODULAR REASONING WITH BRAIN-LIKE SPECIALIZATION   UNDER REVIEW
🔗 Paper 🔗 Website 🐦 Tweets ⭕ github.com/https://github.com/bkhmsi/mixture-of-cognitive-reasoners
Authors: **Badr AlKhamissi**, C. Nicolò De Sabbata, Zeming Chen, Martin Schrimpf*, Antoine Bosselut*

RATIONAL METAREASONING FOR LARGE LANGUAGE MODELS   UNDER REVIEW
🔗 Paper
Authors: C. Nicolò De Sabbata, Theodore R. Sumers, **Badr AlKhamissi**, Antoine Bosselut, Thomas L. Griffiths

FROM LANGUAGE TO COGNITION: HOW LLMS OUTGROW THE HUMAN LANGUAGE NETWORK   UNDER REVIEW
🔗 Paper 🐦 Tweets
Authors: **Badr AlKhamissi**, Greta Tuckute, Yingtian Tang, Taha Binhuraib, Antoine Bosselut*, Martin Schrimpf*

MEDITRON: OPEN MEDICAL FOUNDATION MODELS ADAPTED FOR CLINICAL PRACTICE   UNDER REVIEW
🔗 Paper ⭕ github.com/https://github.com/epfLLM/meditron
Authors: Zeming Chen, Angelika Romanou*, Antoine Bonnet*, Alejandro Hernández-Cano*, **Badr AlKhamissi***, Kyle Matoba*, [...], Physician Evaluation Group, Noémie Boillat-Blanco, Kristina Keitel, Javier Elkin, Blaise Robert, Syrielle Montariol, Mary-Anne Hartley*, Martin Jaggi*, Antoine Bosselut*

SHADOW-CAVE MODELS: HOW PLATO'S ALLEGORY ILLUMINATES THE LIMITATIONS OF LARGE LANGUAGE MODELS   PREPRINT 2023
🔗 Paper 🐦 Tweets
Authors: Muhammad ElNokrashy*, **Badr AlKhamissi***

A REVIEW OF LANGUAGE MODELS AS KNOWLEDGE BASES   PREPRINT 2022
🔗 Paper 🔗 Website 🐦 Tweets
Authors: **Badr AlKhamissi***, Millicent Li*, Asli Celikyilmaz, Mona Diab, Marjan Ghazvininejad

Conferences

THE LLM LANGUAGE NETWORK: A NEUROSCIENTIFIC APPROACH FOR IDENTIFYING CAUSALLY IMPORTANT UNITS   NAACL 2025
Oral 🔗 Paper 🔗 Website ⭕ github.com/https://github.com/bkhmsi/llm-localization
Authors: **Badr AlKhamissi**, Greta Tuckute, Antoine Bosselut*, Martin Schrimpf*

TOPOLM: BRAIN-LIKE SPATIO-FUNCTIONAL ORGANIZATION IN A TOPOGRAPHIC LANGUAGE MODEL   ICLR 2025
Oral 🔗 Paper 🐦 Tweets
Authors: Neil Rathi*, Johannes Mehrer*, **Badr AlKhamissi**, Taha Binhuraib, Nicholas M. Blauch, Martin Schrimpf

INVESTIGATING CULTURAL ALIGNMENT OF LARGE LANGUAGE MODELS   ACL 2024
🔗 Paper 🐦 Tweets ⭕ github.com/https://github.com/bkhmsi/cultural-trends
Authors: **Badr AlKhamissi**, Muhammad ElNokrashy, Mai AlKhamissi, Mona Diab

A CONTEXT-CONTRASTIVE INFERENCE APPROACH TO PARTIAL DIACRITIZATION   ARABICNLP 2024
Oral 🔗 Paper 🔗 Demo ⭕ github.com/https://github.com/munael/ccpd-partial-arabic-diacritization
Authors: Muhammad ElNokrashy, **Badr AlKhamissi**

INSTRUCTION-TUNING ALIGNS LLMS TO THE HUMAN BRAIN   COLM 2024
🔗 Paper 🐦 Tweets
Authors: Khai Loong Aw, Syrielle Montariol*, **Badr AlKhamissi***, Martin Schrimpf, Antoine Bosselut

DEPTH-WISE ATTENTION (DWATT): A LAYER FUSION METHOD FOR DATA-EFFICIENT CLASSIFICATION   LREC-COLING 2024
Oral 🔗 Paper 🔗 Poster
Authors: Muhammad ElNokrashy*, **Badr AlKhamissi***, Mona Diab

"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 Gökce*, 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

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

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.