Mohamed Abdelhack

POSTDOCTORAL FELLOW · KREMBIL CENTRE FOR NEUROINFORMATICS

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Education

Kyoto University   *Kyoto, Japan*
PHD INFORMATICS   *2015 - 2019*
- Advisor: Prof. Yukiyasu Kamitani

Okinawa Institute of Science and Technology   *Okinawa, Japan*
MSC SCIENCE AND TECHNOLOGY   *2012 - 2015*
- Advisor: Dr. Ichiro Maruyama

Alexandria University   *Alexandria, Egypt*
BSC ELECTRICAL ENGINEERING   *2008 - 2012*
- Communications and Electronics Department
- Honors thesis/undergrad research advisor: Dr. Hania Farag

Professional Experience

2021-	**Postdoctoral Fellow**, Krembil Centre for Neuroinformatics, Centre for Addiction and Mental Health
2019-2021	**Postdoctoral Research Assistant**, Department of Anesthesiology, Washington University in St. Louis
2018-2019	**Researcher**, Graduate School of Medicine, Kyoto University
2015-2018	**Research Assistant**, Graduate School of Informatics, Kyoto University
2015-2018	**Student Intern**, Department of Neuroinformatics, Advanced Telecommunication Research Institute
2011	**Summer Intern**, Laboratory of Neural Injury and Repair, Wadsworth Center

Publications

PUBLISHED

Ortiz, Abigail; Sanches, Marcos; **Abdelhack, Mohamed**; Schwaiger, Tyler R; Wainberg, Michael; Tripathy, Shreejoy J; Felsky Daniel; Mulsant Benoit H; Fiedorowicz Jess G. 2022. Sex-specific associations between lifetime diagnosis of bipolar disorder and cardiovascular disease: a cross-sectional analysis of 257,673 participants from the UK Biobank. *Journal of Affective Disorders*.

Hueniken, Katrina; Somé, Nibene Habib; **Abdelhack, Mohamed**; Taylor, Graham; Marshall, Tara Elton; Wickens, Christine M; Hamilton, Hayley A; Wells, Samantha; Felsky, Daniel. 2021. Machine Learning–Based Predictive Modeling of Anxiety and Depressive Symptoms During 8 Months of the COVID-19 Global Pandemic: Repeated Cross-sectional Survey Study. *JMIR mental health*.

Fritz, Bradley A; **Abdelhack, Mohamed**; King, Christopher R; Chen, Yixin; and Avidan, Michael S. 2020. Update to 'Deep-learning model for predicting 30-day postoperative mortality'(Br J Anaesth 2019; 123: 688–95). *British Journal of Anaesthesia*.

Abdelhack, Mohamed and Kamitani, Yukiyasu. 2018. Sharpening of hierarchical visual feature representations of blurred images. *eNeuro*.

Nedelescu, Hermina; **Abdelhack, Mohamed**; and Pritchard, Arwel T. 2018. Regional differences in Purkinje cell morphology in the cerebellar vermis of male mice. *Journal of neuroscience research*.

Nedelescu, Hermina and **Abdelhack, Mohamed**. 2013. Comparative morphology of dendritic arbors in populations of Purkinje cells in mouse sulcus and apex. *Neural Plasticity*.

IN REVIEW

Tripathi, Sandhya; Fritz, Bradley A; **Abdelhack, Mohamed**; Avidan, Michael S; Chen, Yixin; and King, Christopher R. Deep learning to jointly schema match, impute and transform databases. *ACM Transactions on Computing for Healthcare*.

Abdelhack, Mohamed. An in vivo assay to study locomotion in Caenorhabditis elegans. *MethodsX*.

In Prep

Abdelhack, Mohamed; Zhang, Jiaming; Tripathi, Sandhya; Fritz, Bradley A; Feslky, Daniel; Avidan, Michael S; Chen, Yixin; and King, Christopher R. A Modulation Layer to Increase Neural Network Robustness Against Data Quality Issues.

Abdelhack, Mohamed; Murakami, Akio; Majima, Kei; Cheng Fan; Kamitani, Yukiyasu and Takahashi, Hidehiko. Analysis of top-down and bottom-up processes of visual recognition in schizophrenia using deep neural network models

Abdelhack, Mohamed; Zhukovsky, Peter; Milic, Milos and Felsky, Daniel. Effect of sleep on the visual recognition circuitry and its interaction with mental health and cognition.

Awards, Fellowships, Honors, & Grants

2022	**womenmind 2022 Postdoctoral Fellowship Competition**, Centre of Addiction and Mental Health	*CA$ 65,000*
2022	**IBRO Diversity Grant - For Arabs in Neuroscience Initiative**, International Brain Research Organization	*€2,200*
2022	**Highlighted Reviewer of ICLR 2022**, International Conference on Learning Representations	
2019	**Fourth Place in Image Recognition Hackathon**, AI Hack Tunisia	*Internship Offer*
2018	**Monbukagakusho Scholarship**, Japanese Ministry of Education, Culture, Sports, Science and Technology	*¥1.1 M*
2017	**Monbukagakusho Scholarship**, Japanese Ministry of Education, Culture, Sports, Science and Technology	*¥2.3 M*
2017	**Summer School Cost Waiver**, Computational and Cognitive Neuroscience Summer School	*$US 1500*
2016	**Tuition Exemption Award**, Kyoto University	*¥535,800*
2015	**Tuition Exemption Award**, Kyoto University	*¥267,900*
	Admission Fee Waiver Award, Kyoto University	*¥282,000*
2010	**Cairo International Biomedical Engineering Conference Registration Fee Grant**, Misr El Kheir Foundation	*£EG 100*

Presentations

* presenting author; + mentored student

Invited Talks

Jul 2022. *What can human and computer vision reveal to us about brain health?*. Invited talk: Simply Neurocon Conference 2022, Online.

May 2022. *Computational Neuroscience and Applications in Medicine*. Invited webinar: IEEE Engineering in Medicine and Biology Society American University of Sharjah Student Branch, Online.

Apr 2022. *Computational Neuroscience (Arabic)*. Invited webinar: Egypt Scholars.

Oct 2021. *Computational Neuroscience (Arabic)*. Invited webinar: Birzeit University, Online.

Dec 2020. *Top-down modulation in human visual cortex*. Invited webinar: Society for Neuroscientists of Africa.

Contributed Presentations

Salah, Alaa+; Mostafa, Abdalrhman+; Abedi, Reem+; El Masri, Ghinwa*+; Hammad, Ghada+; Eltaras, Menna+; Fadl, Amira+; Khaira, Enas+; **Abdelhack, Mohamed**. 2022. Computational Neuroscience in the Arabic region. Flash Talk: Neuromatch Conference 5.0.

Abdelhack, Mohamed*; Zhukovsky, Peter; Milic, Milos; Felsky, Daniel. 2022. Effect of sleep on neural coding in early visual cortex revealed in a large population study. Poster Presentation: Krembil Centre for Neuroinformatics Open House.

Elsherif, Omar*+, **Abdelhack, Mohamed**. 2021. Modeling Image Sharpening in Human Visual Cortex Using Computer Vision Models. Flash Talk: Neuromatch Conference 4.0.

Abdelhack, Mohamed*. 2021. Big Data in the Wild: Modulation of Artificial Intelligence Model Weights in Real Time. Oral Talk: Krembil Centre for Neuroinformatics Open House.

Abdelhack, Mohamed*. 2021. Modulation Layer for Combating Missing Data. Oral Talk: Anesthesiology Research Data Blitz, Washington University in St. Louis, St. Louis, MO.

Abdelhack, Mohamed* and Kamitani, Yukiyasu. 2020. Visual Misrecognition Reveals Contradiction between Lower and Higher Visual Cortex Activations. Flash Talk: Neuromatch Conference 3.0.

Abdelhack, Mohamed*; King, Christopher R; Tripathi, Sandhya; Fritz, Bradley; Chen, Yixin; Avidan, Michael. 2020. Post-operative Mortality Prediction with and Without the Use of Intraoperative Features. Poster Presentation: AMIA 2020 Symposium.

Abdelhack, Mohamed* and Kamitani, Yukiyasu. 2019. Top-down Modulation in Human Visual Cortex Revealed by Brain Decoding with Deep Neural Network Representation. Poster Presentation: CiNet Conference, Osaka, Japan.

Murakami, Akio*; **Abdelhack, Mohamed***; Majima, Kei; Cheng Fan; Kamitani, Yukiyasu and Takahashi, Hidehiko. 2019. Representational structure of the higher visual cortex in schizophrenia. Poster Presentation: Mechanism of Brain and Mind Winter Workshop, Hokkaido, Japan.

Murakami, Akio*; **Abdelhack, Mohamed***; Majima, Kei; Cheng Fan; Kamitani, Yukiyasu and Takahashi, Hidehiko. 2018. Analysis of top-down and bottom-up processes of visual recognition in schizophrenia using deep neural network models. Poster Presentation: International Consortium on Hallucination Research, Kyoto, Japan.

Abdelhack, Mohamed* and Kamitani, Yukiyasu. 2017. Top-down neural processing that supplements missing image features revealed by brain decoding with deep neural network representation. Poster Presentation: Vision Science Society Annual Meeting, St. Pete Beach, FL.

Nedelescu, Hermina*; **Abdelhack, Mohamed**; and Pritchard, Arwel T. 2016. Purkinje cell heterogeneity in the anterior and posterior cerebellar lobule. Dynamic Poster Presentation: Society for Neuroscience annual meeting, San Diego, CA.

Abdelhack, Mohamed* and Maruyama, Ichiro. 2015. Locomolyzer: a comprehensive tool for animal locomotion analysis. Poster Presentation: Congress of the European Society of Biomechanics, Prague, Czechia.

Abdelhack, Mohamed*. 2014. Adaptation in locomotion behavior of Caenorhabditis elegans. Poster Presentation: Okinawa Computational Neuroscience Course, Okinawa, Japan.

Abdelhack, Mohamed* and Nedelescu, Hermina. 2013. Investigating the effect of anatomical location on Purkinje cell morphology. Poster Presentation: Society for Neuroscience annual meeting, San Diego, CA.

Teaching Experience

Aug 2022	**IBRO-Simons Computational Neuroscience Imbizo**, Teaching Assistant	*Cape Town, South Africa*
Jun 2022	**Introduction to Computational Neuroscience**, Lecturer and Course Lead	*Online*
Jul 2020	**Neuromatch Academy**, Lead Teaching Assistant	*Online*
Jul 2009 & Jun 2012	**IEEE Alexandria Student Branch**, C Programming Instructor	*Alexandria, Egypt*

Mentoring

2021-	**Abdalrhman Mostafa**, Mentee, Arabs in Neuroscience	*Online*
2021	**Omar ElSharif**, Mentee, Arabs in Neuroscience	*Online*
2020-2021	**Jiaming Zhang**, Intern, Department of Computer Science, Washington University in St. Louis	*Online*
2020-2021	**Jerome Gammie**, Intern, Department of Computer Science, Washington University in St. Louis	*St. Louis MO*

Outreach & Professional Development

SERVICE AND OUTREACH

2022	**Neuromatch Conference 5.0**, Organizer	*Online*
2020-	**Arabs in Neuroscience**, Founder	*Online*
2021-	**The Africa I Know**, Mentorship Team Member	*Online*
2021	**Neuromatch Conference 4.0**, Organizer	*Online*
2021	**Neuromatch Academy**, Chief Communication Officer & Outreach Coordinator	*Online*
2021	**Neuromatch Academy Computational Neuroscience Summer School**, Project Mentor	*Online*
2019-2021	**Washington University Postdoc Society**, Policy Committee Member	*St. Louis MO*
2013	**An Introduction to Interdisciplinary Science Workshop**, Instructor	*Okinawa, Japan*
2011	**Brain-Computer Interfacing Challenge** , Judging Panel Member	*Albany, NY*

DEVELOPMENT

Cultivating Community in Academia, online interview at the show "PhD - The Philosophical Drama."

Careers in Neuroscience Panel Discussion, invited by Alexandria Neuroscience Committee.

Computational and Cognitive Neuroscience Summer School 2017, New York University Shanghai, China.

OIST Computational Neuroscience Course 2014, Okinawa, Japan.

PEER REVIEW

Journals
Neural Networks
PLOS One
British Journal of Anaesthesia
Journal of Biomedical Informatics
Conferences
The Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Learning Representations (ICLR)
The International Joint Conference on Artificial Intelligence (IJCAI)
IEEE Big Data

PROFESSIONAL MEMBERSHIPS

Society for Neuroscience
Temerty Centre for AI Research and Education in Medicine