

I am a senior research scientist at Google Deepmind. I'm passionate about advancing ethical and inclusive AI, with a particular focus on developing robust multimodal systems, understanding neural network behavior, and addressing fairness and cultural diversity in machine learning models. I am also interested in the application of mathematical tools, such as fractals, statistical learning theory & information theory, to understand the capabilities and limitations of deep neural networks. Previously, I founded and led the Advanced Analytics team at Saudi Aramco, managed the company's Enterprise Analytics program, and was a technical lead at its digital transformation program.

## EDUCATION

### Doctor of Philosophy - PhD, Computer Science , KAUST, GPA: 4.0 / 4.0

Thesis title: "Learning via Query Synthesis." Committee: X. Zhang, X. Gao, D. Keyes (KAUST), and W. Wang (UCLA). 2012 — 2017

### Master of Science, Electrical Engineering, Stanford University, GPA: 4.15 / 4.0

Emphasis on networked systems, artificial intelligence, and operations management. 2009 — 2011

### Bachelor of Science, Computer Engineering, University of Nebraska, Lincoln, GPA: 3.98 / 4.0

Highest Distinction; Superior Scholarship Award; Minor in Economics. 2000 — 2005

## PROFESSIONAL SKILLS & COMPETENCIES

**Research & Development** 1 book, +35 research papers, 7 patents (1 granted and 6 filed).

**Communication** English (fluent), Arabic (native), German (elementary, A2).

**Technical** Artificial intelligence, data science, modeling & optimization, digital transformation, networked systems (certified by Cisco, Juniper and Alcatel-Lucent).

**Leadership** +2 years managing corporate-wide enterprise analytics program, leading the data science team, and serving as a technical lead at the digital transformation program at Saudi Aramco.

+4 years leading cross-team research collaboration projects on deep learning, computer vision, and ethical AI at Google Deepmind.

## SELECTED VOLUNTARY CONTRIBUTIONS

Area chair at NeurIPS. 2024 — Present

Program committee member NeurIPS, ICML, ICLR, AAAI, CVPR, and ECCV. 2017 — Present

Outstanding reviewer award @ ICML 2020 and NeurIPS 2022, 2023

Editorial reviewer at TMLR, IEEE PAMI, IEEE TNNLS, and IEEE Communications Letters. 2019 — Present

Member of the S20 Task Force (Digital Revolution). 2020

Chair of the AI track of the 2019 Arab-American Frontiers Symposium. 2019

## PROFESSIONAL EXPERIENCE

### RESEARCH & DEVELOPMENT

NOV 2019 — Present

Google Deepmind

Zürich, Switzerland

- Led / co-led several projects on deep learning and ethical AI; e.g. multimodal systems, pretraining with random labels, debiasing neural networks, data scaling laws, optimizing ViTs, and calibration/robustness.
- Member of technical team that released Google's open-source multimodal system Paligemma.
- Member of the grand vision and ML fairness in healthcare moonshots.
- Member of the Google Scholarship Review Team and mentor of AI residents & student researchers.

### ENTERPRISE ANALYTICS

NOV 2017 — OCT 2019

Saudi Aramco, Corporate Applications Dept

Dhahran, Saudi Arabia

- Founded and led the Advanced Analytics team that was responsible for developing AI solutions, managing analytics infrastructures, conducting research collaboration with academia, evaluating technologies, and crafting strategic roadmaps.
- Technical lead at the Digital Transformation Program, accelerating the integration and adoption of AI across the company.
- Spearheaded the roll-out of the "Data Science" specialization program and the launch of a hosted M.S. in Analytics with +20 students graduated.
- Led the design & implementation of ML applications in sectors such as downstream, supply chain, sales & marketing, IT & HR.

### PERFORMANCE & OPTIMIZATION

JUN 2011 — AUG 2012

Saudi Aramco, Comm. Eng. Department

Dhahran, Saudi Arabia

- Performance management and capacity planning for enterprise communications services such as the Data Center, the Internet, Extranet, and Wireless LAN infrastructures.
- Won the Operation Services Business Line recognition award (2012) for "distinguished achievements."
- Developed analytical tools for automated performance measurement and SLA compliance assessment.

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## DATA NETWORKING

Saudi Aramco, Comm. Eng. Department

JUL 2005 — AUG 2009

Dhahran, Saudi Arabia

- Won the Information Technology Admin Area recognition award (2007) for “developing innovative solutions” and the Communications Eng Dept recognition award (2009) for “significant contributions to department’s success.”
- Key member of an 18-month IT network security project for securing critical facilities.
- Project manager for a 1-year CCTV surveillance camera systems project (involving civil and communications work).
- Design, installation, configuration, reviews, upgrades, and troubleshooting of data networks.

## BOOKS

Ibrahim Alabdulmohsin, *Summability Calculus: A Comprehensive Theory of Fractional Finite Sums*, Springer, 2018.

## RECENT PREPRINTS

- Wang, X., Alabdulmohsin, I., Salz, D., Li, Z., Rong, K. and Zhai, X. Scaling pre-training to one hundred billion data for vision language models. arXiv preprint arXiv:2502.07617, 2025.
- Tschannen, M., Gritsenko, A., Wang, X., Naeem, M.F., Alabdulmohsin, I., Parthasarathy, N., Evans, T., Beyer, L., Xia, Y., Mustafa, B. and Hénaff, O.. “Siglip 2: Multilingual vision-language encoders with improved semantic understanding, localization, and dense features.” arXiv preprint arXiv:2502.14786, 2025.
- Andreas Steiner, André Susano Pinto, Michael Tschannen, Daniel Keysers, Xiao Wang, Yonatan Bitton, Alexey Gritsenko, Matthias Minderer, Anthony Sherbondy, Shangbang Long, Siyang Qin, Reeve Ingle, Emanuele Bugliarello, Sahar Kazemzadeh, Thomas Mesnard, Ibrahim Alabdulmohsin, Lucas Beyer, Xiaohua Zhai. “PaliGemma 2: A Family of Versatile VLMs for Transfer.” arXiv:2412.03555 [cs.CV], 2024.

## PUBLICATIONS

- Alabdulmohsin, I. and Zhai, X.: Recursive Inference Scaling: A Winning Path to Scalable Inference in Language and Multimodal Systems. **NeurIPS**, 2025.
- Alabdulmohsin, I. and Steiner, A: A Tale of Two Structures: Do LLMs Capture the Fractal Complexity of Language? **ICML**, 2025.
- Angéline Pouget, Lucas Beyer, Emanuele Bugliarello, Xiao Wang, Andreas Peter Steiner, Xiaohua Zhai, Ibrahim Alabdulmohsin. “No Filter: Cultural and Socioeconomic Diversity in Contrastive Vision-Language Models.” **NeurIPS**, 2024.
- Ibrahim Alabdulmohsin, Vinh Q. Tran, and Mostafa Dehghani. “Fractal Patterns May Illuminate the Success of Next-Token Prediction.” **NeurIPS**, 2024.
- Bo Wan, Michael Tschannen, Yongqin Xian, Filip Pavetic, Ibrahim Alabdulmohsin, Xiao Wang, André Susano Pinto, Andreas Steiner, Lucas Beyer, Xiaohua Zhai. “LocCa: Visual Pretraining with Location-aware Captioners.” **NeurIPS**, 2024.
- Lucas Beyer, Andreas Steiner, André Susano Pinto, Alexander Kolesnikov, Xiao Wang, Daniel Salz, Maxim Neumann, Ibrahim Alabdulmohsin, Michael Tschannen, Emanuele Bugliarello, Thomas Unterthiner, Daniel Keysers, Skanda Koppula, Fangyu Liu, Adam Grycner, Alexey Gritsenko, Neil Houlsby, Manoj Kumar, Keran Rong, Julian Eisenschlos, Rishabh Kabra, Matthias Bauer, Matko Bošnjak, Xi Chen, Matthias Minderer, Paul Voigtlaender, Ioana Bica, Ivana Balazevic, Joan Puigcerver, Pinelopi Papalampidi, Olivier Henaff, Xi Xiong, Radu Soricut, Jeremiah Harmsen, Xiaohua Zhai. “PaliGemma: A versatile 3B VLM for transfer.” arXiv:2407.07726 [cs.CV], 2024.
- Ibrahim Alabdulmohsin, Xiao Wang, Andreas Peter Steiner, Priya Goyal, Alexander D’Amour, Xiaohua Zhai: “CLIP the Bias: How Useful is Balancing Data in Multimodal Learning? ”, **ICLR**, 2024.
- Xi Chen, Xiao Wang, Lucas Beyer, Alexander Kolesnikov, Jialin Wu, Paul Voigtlaender, Basil Mustafa, Sebastian Goodman, Ibrahim Alabdulmohsin, Piotr Padlewski, Daniel Salz, Xi Xiong, Daniel Vlasic, Filip Pavetic, Keran Rong, Tianli Yu, Daniel Keysers, Xiaohua Zhai, Radu Soricut: “PaLI-3 Vision Language Models: Smaller, Faster, Stronger.” arXiv:2310.09199, 2023.
- Xi Chen, Josip Djolonga, Piotr Padlewski, Basil Mustafa, Soravit Changpinyo, Jialin Wu, Carlos Riquelme Ruiz, Sebastian Goodman, Xiao Wang, Yi Tay, Siamak Shakeri, Mostafa Dehghani, Daniel Salz, Mario Lucic, Michael Tschannen, Arsha Nagrani, Hexiang Hu, Mandar Joshi, Bo Pang, Ceslee Montgomery, Paulina Pietrzyk, Marvin Ritter, AJ Piergiovanni, Matthias Minderer, Filip Pavetic, Austin Waters, Gang Li, Ibrahim Alabdulmohsin, Lucas Beyer, Julien Amelot, Kenton Lee, Andreas Peter Steiner, Yang Li, Daniel Keysers, Anurag Arnab, Yanzhong Xu, Keran Rong, Alexander Kolesnikov, Mojtaba Seyedhosseini, Anelia Angelova, Xiaohua Zhai, Neil Houlsby, Radu Soricut: “PaLI-X: On Scaling up a Multilingual Vision and Language Model ”, **CVPR**, 2024.
- Ibrahim Alabdulmohsin, Xiaohua Zhai, Alexander Kolesnikov, Lucas Beyer: “Getting ViT in Shape: Scaling Laws for Compute-Optimal Model Design ”, **NeurIPS**, 2023.
- Mostafa Dehghani, Basil Mustafa, Josip Djolonga, Jonathan Heek, Matthias Minderer, Mathilde Caron, Andreas Steiner, Joan Puigcerver, Robert Geirhos, Ibrahim Alabdulmohsin, Avital Oliver, Piotr Padlewski, Alexey Gritsenko, Mario Lucic, Neil Houlsby: “Patch n’ Pack: NaViT, a Vision Transformer for any Aspect Ratio and Resolution ”, **NeurIPS**, 2023.
- Dehghani, M., Djolonga, J., Mustafa, B., Padlewski, P., Heek, J., Gilmer, J., Steiner, A., Caron, M., Geirhos, R., Alabdulmohsin, I., et al. “Scaling Vision Transformers to 22 Billion Parameters.” **ICML**, 2023.

- Lucas Beyer, Pavel Izmailov, Alexander Kolesnikov, Mathilde Caron, Simon Kornblith, Xiaohua Zhai, Matthias Minderer, Michael Tschannen, [Ibrahim Alabdmohsin](#), Filip Pavetic: “FlexiViT: One Model for All Patch Sizes.”, **CVPR**, 2023.
- [Ibrahim Alabdmohsin](#), Nicole Chiou, Alexander D’Amour, Arthur Gretton, Sanmi Koyejo, Matt J. Kusner, Stephen R. Pfohl, Olawale Salaudeen, Jessica Schrouff, Katherine Tsai: “Adapting to Latent Subgroup Shifts via Concepts and Proxies.”, **AISTATS**, 2023.
- [Ibrahim Alabdmohsin](#), Behnam Neyshabur, Xiaohua Zhai: “Revisiting Neural Scaling Laws in Language and Vision.”, **NeurIPS**, 2022.
- [Ibrahim Alabdmohsin](#), Jessica Schrouff, Oluwasanmi Koyejo: “A Reduction to Binary Approach for Debiasing Multiclass Datasets.”, **NeurIPS**, 2022.
- Jessica Schrouff, Natalie Harris, Oluwasanmi Koyejo, [Ibrahim Alabdmohsin](#), Eva Schnider, Krista Opsahl-Ong, Alexander Brown, Subhrajit Roy, Diana Mincu, Christina Chen, Awa Dieng, Yuan Liu, Vivek Natarajan, Alan Karthikesalingam, Katherine A. Heller, Silvia Chiappa, Alexander D’Amour: “Maintaining fairness across distribution shift: do we have viable solutions for real-world applications?”, **NeurIPS**, 2022.
- Alexander Soen, [Ibrahim Alabdmohsin](#), Sanmi Koyejo, Yishay Mansour, Nyalleng Moorosi, Richard Nock, Ke Sun, Lexing Xie: “Fair Wrapping for Black-box Predictions.”, **NeurIPS**, 2022.
- Amr Khalifa\*, Michael C. Mozer, Hanie Sedghi, Behnam Neyshabur, [Ibrahim Alabdmohsin](#)\*: “Layer-Stack Temperature Scaling.” arXiv:2211.10193, 2022.
- [Ibrahim Alabdmohsin](#), Mario Lucic: “A Near-Optimal Algorithm for Debiasing Trained Machine Learning Models.”, **NeurIPS**, 2021.
- [Ibrahim Alabdmohsin](#), Larisa Markeeva, Daniel Keysers, Ilya O. Tolstikhin: “A Generalized Lottery Ticket Hypothesis.”, **SNN**, 2021.
- [Ibrahim Alabdmohsin](#), Hartmut Maennel, Daniel Keysers: “The Impact of Reinitialization on Generalization in Convolutional Neural Networks.”, arXiv:2109.00267, 2021.
- [Ibrahim Alabdmohsin](#): “A Generalization of Classical Formulas in Numerical Integration and Series Convergence Acceleration.”, CoRR abs/2106.07621, 2021.
- Hartmut Maennel\*, [Ibrahim Alabdmohsin](#)\*, Ilya O. Tolstikhin, Robert J. N. Baldock, Olivier Bousquet, Sylvain Gelly, Daniel Keysers: “What Do Neural Networks Learn When Trained With Random Labels?”, **NeurIPS**, 2020.
- [Ibrahim Alabdmohsin](#): “Towards a Unified Theory of Learning and Information.”, **Entropy** 22(4), 2020.
- [Ibrahim Alabdmohsin](#): “Information Theoretic Guarantees for Empirical Risk Minimization with Applications to Model Selection and Large-Scale Optimization.”, **ICML**, 2018.
- [Ibrahim Alabdmohsin](#): “Axiomatic Characterization of AdaBoost and the Multiplicative Weight Update Procedure.”, **ECML/PKDD**, 2018.
- [Ibrahim Alabdmohsin](#): “Fractional parts and their relations to the values of the Riemann zeta function.”, **Arabian Journal Of Mathematics** 7.1 (2018): 1-8.
- [Ibrahim Alabdmohsin](#): “An Information-Theoretic Route from Generalization in Expectation to Generalization in Probability.”, **AISTATS**, 2017.
- [Ibrahim Alabdmohsin](#), Moustapha Cisse, Xin Gao, Xiangliang Zhang: “Large margin classification with indefinite similarities”, **Machine Learning Journal** 103(2), 2016.
- [Ibrahim Alabdmohsin](#), Yufei Han, Yun Shen, Xiangliang Zhang: “Content-Agnostic Malware Detection in Heterogeneous Malicious Distribution Graph”, **CIKM**, 2016.
- [Ibrahim Alabdmohsin](#), Moustapha Cissé, Xiangliang Zhang: “Is Attribute-Based Zero-Shot Learning an Ill-Posed Strategy?”, **ECML/PKDD**, 2016.
- [Ibrahim Alabdmohsin](#), Xin Gao, Xiangliang Zhang: “Efficient Active Learning of Halfspaces via Query Synthesis”, **AAAI**, 2015.
- [Ibrahim Alabdmohsin](#): “Algorithmic Stability and Uniform Generalization.”, **NeurIPS**, 2015.
- [Ibrahim Alabdmohsin](#), Xin Gao, Xiangliang Zhang: “Support vector machines with indefinite kernels.”, **ACML**, 2014.
- [Ibrahim Alabdmohsin](#), Xin Gao, Xiangliang Zhang: “Adding Robustness to Support Vector Machines Against Adversarial Reverse Engineering.”, **CIKM**, 2014.
- [Ibrahim Alabdmohsin](#), Amal Hyadi, Laila H. Afify, Basem Shihada: “End-to-end delay analysis in wireless sensor networks with service vacation.”, **WCNC**, 2014.
- [Ibrahim Alabdmohsin](#): “Techniques and algorithms for access control list optimization .”, **Computers & Electrical Engineering Journal**, 2009.