Ahmed M. A. Sayed

a.k.a. Ahmed M. Abdelmoniem

Senior Lecturer (Assoc. Prof.)
Queen Mary University of London
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Research Profile

I lead SAYED Systems Group (`https://sayed-sys-lab.github.io`) in which we build Scalable, Advanced Yet Efficient Distributed Systems of the Future. Our research spans inter-related disciplines of computer science and engineering with a focus on system design and optimization for machine learning systems (training and inference efficiency, distributed ML, federated learning), distributed systems (architecture design, performance analysis, resource allocation, algorithmic optimization), computer networks (traffic engineering, congestion control, performance optimization, software-defined networking), and wireless networks (routing in mobile ad-hoc and wireless sensor networks). I have published more than 120 papers in top-tier venues on these topics. I am part of QMUL's Networks, Communication, and Systems Research Centre (`https://www.seresearch.qmul.ac.uk/cncs/`). I work closely with the Networks group (`https://networks.eecs.qmul.ac.uk/`) and other academics at QMUL and various research groups in the UK and worldwide. I lead the UKRI-EPSRC research project named KUber (`http://kuber.org.uk/`).

Current Research Interests

- Systems for ML & ML for Systems
- Edge AI & Federated/Distributed Machine Learning
- Efficient and Resource-Constrained Generative AI & LLM
- Internet of Things, Digital Twin, and Sustainable Computing
- Computer Networks and Distributed Systems

Grants and Funding

2024-2027 **PI - EPSRC - UKRI**, *KUber: Knowledge Delivery System for Machine Learning at Scale (`https://kuber.org.uk`)*, New Investigator Award, Granted 650K GBP

2025-2026 **Co-I - UKRI**, *FAIR-Compute: A Roadmap for Fair and Efficient Allocation of Federated Digital Research Infrastructure*, NCFS NetworkPlus Project, Granted 120K GBP

2025-2026 **PI - Huawei Research UK/Germany/China**, *Server Energy-Efficiency Testing and Benchmarking*, Short-Term Joint Project, Granted 31K GBP

2022 **CoI - EPSRC - REPHRAIN Center**, *Moderation in Decentralised Social Networks (DSNmod)*, Granted 81K GBP

2022 **CoI - HKRGC - GRF**, *ML Congestion Control in SDN-based Data Center Networks*, Granted 600K HKD

2021 **CoI - KAUST - Competitive Research Grant**, *Machine Learning Architecture for Task-based Information Transfer*, Granted 400K USD

2013 **PhD - HKPFS - HK Research Grand Council**, *Efficient Optimizations for Water Pipes Monitoring Wireless Sensor Networks*, Granted - 150K USD

Education

2013-2017 **Ph.D., Computer Science and Engineering (GGA 4.0/4.2)**, *Computer Science and Engineering Department, Hong Kong University of Science and Technology*, Hong Kong

PhD Thesis

Title *On Improving The Performance of TCP Applications in Public Cloud Networks*

Supervisor Assoc. Prof. Brahim Bensaou (CSE, HKUST)

Committee Prof. Gary Chan (CSE, HKUST), Prof. Danny Tsang (ECE, HKUST), Assoc. Prof. Kai Chen (CSE, HKUST), Assoc. Prof. Chun Tung Chou (UNSW, Australia)

Description The research led to proposing efficient schemes that have achieved considerable performance gains for cloud applications via mathematical modeling, empirical analysis, simulation, hardware prototyping and real-tested implementation and experiments on various network scenarios and topologies.

2008–2012 **M.Sc./M.Res (Masters by Courses followed by Research), Computer Science (Distinction, ranked** 1^{st}**)**, *Computer Science Department, Faculty of Computers and Information, Assiut University*, Egypt

Masters Thesis

Title *Routing Optimization of Mobile AD-HOC Networks Based on Ant Colony Algorithms*

supervisor Prof. Hosni Ibrahim, Prof. Marghany H. Mohamed, Asst. Prof. Abdel-Rahman Hedar

Description The research work led to proposing efficient routing optimizations based on Ant Colony Algorithms (ACO) that have demonstrated to achieve considerable performance gains for Mobile Ad-Hoc Networks (MANET) routing protocols via mathematical modelling, simulation analysis and implementation on various network scenarios and topologies. The research project, conducted while working full-time as a Lecturer Assistant, led to one International Conference and one International Journal Publication.

2003–2007 **B.Sc., Computer Science (Distinction with Honors, ranked** 2^{nd}**)**, *Computer Science Department, Faculty of Computers and Information, Assiut University*, Egypt

Bachelors Thesis

Title *Enabling Video Calls over Internet and Bluetooth* - Ministry of Telecommunications, Egypt

Description Full system implementation of end-to-end video calls system over Bluetooth and Internet using C# on the back-end server and J2ME on camera-ready mobile devices.

2000–2003 **Egyptian General Secondary Examination (98.2%, ranked in the top 200 out of 400K+ student)**, *Almoshir Ahmed Esmail Secondary School*, Assiut, Egypt

Work Experience

Aug 2024– **Senior Lecturer (Associate Professor) & Director, MSc Data Science Program**, *School of Electronic Engineering & Computer Science, Queen Mary University of London*

Duties **"Research:"** Managing research teams and active grants. Conducting scientific research in computer science and publishing high-quality papers, supervising M.S./Ph.D. students, and preparing research grant proposals. **"Teaching:"** Organizing and delivering modules at both the undergraduate and postgraduate levels. Performance assessment of students in weekly self-practice tasks. Interacting with students within office hours. Preparing and mentoring written examinations and course projects. **"Administration:"** Responsibility for developing and maintaining the MSc Data Science Programme. Active membership in school meetings to discuss departmental and school matters (teaching, research, and school management). Supporting the Networks group and DERI activities. **"Self-Development:"** Organizing workshops and delivering keynote talks and plenary panels in top venues.

Modules Module organizer and sole lecturer for ***ECS765P - Big Data Processing*** module taught as part of the MSc Data Science Programme for the postgraduate level (level-7)

Module organizer and sole lecturer for ***EC640U/A/757P - Big Data Processing*** module for both undergraduate (level-6) and postgraduate (level-7) levels

2021–2024 **Lecturer (Assistant Professor) & Director, MSc Big Data Science Program**, *School of Electronic Engineering & Computer Science, Queen Mary University of London*, UK

Duties **"Research:"** Managing research teams and active grants. Conducting scientific research in computer science and publishing high-quality papers, supervising M.S./Ph.D. students, and preparing research grant proposals. **"Teaching:"** Organizing and delivering modules at both the undergraduate and postgraduate levels. Performance assessment of students in weekly self-practice tasks. Interacting with students within office hours. Preparing and mentoring written examinations and course projects. **"Administration:"** Responsibility for developing and maintaining the BDS Programme activities about areas of interest and innovation within the Faculty. Active membership in school meetings to discuss departmental and school matters (teaching, research, and school management). **"Self-Development:"** Completed 2 years long PGCAP (4 modules), completed all necessary essential training for the role, and participated in several professional development courses and workshops.

Modules Module organizer and sole lecturer for ***ECS765P - Big Data Processing*** module taught as part of the MSc Data Science Program for the postgraduate level (level-7)

Co-organize and teach the ***ECS637U/ECS757P - Digital Media and Social Networks*** module for both undergraduate (level-6) and postgraduate (level-7) levels

2020–2021 **Research Scientist**, *King Abdullah University of Science and Technology (KAUST)*, KSA

Duties Develop and write research proposals for obtaining research funding grants. Supervise graduate students. Collect resources and work with team members to complete the research plans. Present research results at meetings and engage in result publications. Learn research directions by attending research seminars, workshops, and conferences. Review the literature and analyze their results. Systematically conduct research focusing on improving the performance, scalability, and interpretability of distributed ML. Find efficient solutions for challenging computer science research problems. Design experiments to verify existing and new solutions and techniques. Write papers and publish them in reputed venues and journals. Communicate ideas and results with the group. Understand relevant literature.

2019–2020 **Post-Doctoral Research Fellow**, *Extreme Computing Research Center (ECRC), King Abdullah University of Science and Technology (KAUST)*, Saudi Arabia

Duties Find efficient solutions for challenging CS research problems. Design experiments to verify existing and new solutions and techniques. Collect resources and work with team members to complete the research plan. Develop and write research proposals for obtaining grants. Present research results at meetings and engage in result publications. Attend research seminars, workshops, and conferences to learn about the new research directions and findings. Review the literature and analyze their results. Conduct computer and network system research focusing on improving the performance, scalability, and interpretability of distributed ML. Prepare manuscripts to publish in top venues and journals. Communicate ideas and results with members. Understand relevant scientific literature. Work with group members.

2017-2018 **Senior Researcher**, *Future Network Theory Lab. Huawei Technologies Investing Co. Ltd.*

Duties Conducting research in network control, traffic engineering, and resource management. Leading the system research directions of the Lab. Research proposal preparation. Research publications. Patent development. Collaboration work management. Recruitment.

Contributions I have contributed with our team to the redefinition and formulation of the application-driven networking (ADN) vision and its system implementation and evaluation both in simulation and real-tested environments. ADN is a major long-term project that has resulted in a few papers and patent submissions. I have participated and taken the lead on several projects. A few projects are in direct collaboration with renowned professors at Stanford, CalTech, Cornell, CUHK, CityU, HKUST, Nanjing, and Tsinghua Universities. Moreover, I finished a stalled project in a record time. Other projects involved working closely with 4 interns to bring them to completion. Been actively responsible for the recruitment process for new hires and interns to our lab during different venues (e.g., SIGCOMM & NSDI & INFOCOM, etc). Successfully recruited 3 new full-time hires and 1 intern for the lab.

2018– **Assistant Professor**, *Faculty of Computers and Information, Assiut University*, Egypt

Duties **"Research:"** Conducting research in computer science and publishing high-quality papers, supervising M.S./Ph.D. students and preparing research grant proposals. **"Teaching:"** Teaching and managing Computer Science courses at both the undergraduate level such as ***Software Engineering***, ***Project Management***, ***Software Development and Technical Practice***, ***Computer Security*** and ***Parallel Computing*** and postgraduate level such as ***Object-Oriented Software Engineering*** and ***Intro to Computers - Fine Arts***. Performance assessment of students in weekly self-practice tasks. Interacting with students within office hours. Preparing and mentoring written examinations and course projects. **"Administrative highlights:"** Active membership in faculty committee meetings to discuss departmental and school matters (teaching, research and school management). Active membership in department and school councils. Organizing research seminars. Director of Information Technology unit of the school. Membership in research council committees.

2012–2018 **Assistant Lecturer**, *Faculty of Computers and Information, Assiut University*, Egypt

Duties Conducting scientific research in computer science and publishing high-quality papers. Pursuing my Doctorate degree. Teaching in classes and laboratories ***Computer Networking***, ***Network Programming*** and ***Network Analysis and Design*** to undergraduate students. Performance assessment of students in weekly self-practice tasks. Interacting with students within office hours. Mentoring and grading written examination and course projects

2018-2021 **Technical Advisor**, *DeepCloudAI - a Decentralized AI-Driven Cloud Infrastructure*

Duties Advising throughout the development of DeepCloudAI (`www.deepcloudai.com`) project, including but not limited to advising the development of white paper and technical paper, advising the development of the prototype. Consultation on the technical questions and technical problem solutions. Advising on the technical-related activities that is required for the completion of the Initial Coin Offering campaign.

2016-2017 **Teaching Assistant**, *Department of Computer Science and Engineering, The Hong Kong University of Science and Engineering.*

Duties Assist in teaching and delivery of ***Computer Networks - COMP 5621*** PG Core, ***Computer Networks: An Internet-Perspective - CSIT5610*** MSCIT course to post-graduate students, and ***inux Kernel Network Programming***. Grading examination papers. Students' consultation. Examination proctoring.

2007–2012 **Teaching Assistant**, *Faculty of Computers and Information, Assiut University*, Egypt

Duties Conducting scientific research in computer science and publishing high-quality papers. Pursuing my Masters degree. Teaching in classes and laboratories ***Computer Networking***, ***Network Programming***, ***Object-Oriented Programming using C++***, ***Introduction to JAVA Programming***, ***Introduction To Computers***, ***Software Testing***, ***Data Structure***, ***Algorithms***, ***Artificial Intelligence***, ***Operating Systems***, ***Distributed Database*** and ***IT Project Management*** to undergraduate students. Performance assessment of students in weekly lab tasks. Interacting with students within office hours. Mentoring and grading written examination and course projects

5-Key Recent Publications - See Page 10 for Detailed List

- Norah Alballa, Wenxuan Zhang, Ziquan Liu, **Ahmed M. Abdelmoniem**, Mohamed Elhoseiny, Marco Canini. **"Query-based Knowledge Transfer for Heterogeneous Learning Environments"**. *Int. Conf. on Representation Learning (ICLR), 2025*
  Link: `https://openreview.net/forum?id=XKv29sMyjF`
  Code: TBC
- Ahmad Faraz Khan, Azal Ahmad Khan, **Ahmed M. Abdelmoniem**, Samuel Fountain, Ali Butt, Ali Anwar. **"FLOAT: Federated Learning Optimizations with Automated Tuning"**. *Proceedings of ACM EuroSys, Athens, Greece, 2024*
  Link: `https://doi.org/10.1145/3627703.3650081`
  Code: `https://github.com/AFKD98/FLOAT`
- Amna Arouj, **Ahmed M. Abdelmoniem**, **"Towards Energy-Aware Federated Learning via Collaborative Computing Approach"**, in *Computer Communications, Elsevier, 2024*
  Link: `https://doi.org/10.1016/j.comcom.2024.04.012`
  Code: `https://github.com/SAYED-Sys-Lab/EAFL/tree/enhanced_version`
- **Ahmed M. Abdelmoniem**, AN Sahu, M Canini, SA Fahmy. **"REFL: Resource Efficient Federated Learning"**. *Proceedings of ACM EuroSys, Rome, Italy, 2023.*
  Link: `https://doi.org/10.1145/3552326.3567485`
  Code: `https://github.com/ahmedcs/REFL`
- **Ahmed M. Abdelmoniem**, Ahmed Elzanaty, Mohamed Slim-alouini, Marco Canini. **"An Efficient Statistical-based Gradient Compression Technique for Distributed Training Systems"**. *Int. Conf. on Machine Learning & Systems (MLSys), Online, 2021.*
  Link: `https://proceedings.mlsys.org/paper_files/paper/2021/hash/fea47a8aa372e42f3c84327aec9506cf-Abstract.html`
  Code: `https://github.com/sands-lab/SIDCo`

Other Research Interests

- Congestion Control, Resource Allocation, and Traffic Engineering
- Software Defined Networking and Network Function Virtualization
- Feedback Control of Hybrid and Switched Systems
- Mobile Ad-hoc Networks and Wireless Sensors Network
- AI Optimization and Genetic algorithms

Sample Projects

- FAIR-Compute: A Roadmap for Fair and Efficient Allocation of Federated Digital Research Infrastructure, 2025 – Now
- Green Data Centres (GreenDC): Server Energy-Efficiency Testing and Benchmarking Project, 2025 – Now
- Towards Scalable Agentic AI Orchestration and Routing, 2025 – Now
- Resource Efficient Training and Fine-Tuning of Generative AI and LLMs, 2025 – Now
- KUber: Knowledge Discovery System for Machine Learning at Scale (project website `https://kuber.org.uk`), 2024 – Now
- ML Congestion Control in SDN-based Data Centre Networks, 2022 – Now
- Moderation in Decentralised Social Networks (DSNmod), 2022 – 2023
- Machine Learning Architecture for Task-based Information Transfer, 2021 – Now
- Efficient Decentralised Learning in Heterogeneous Mobile Edge Computing, 2020 – Now
- Resource Efficient Federated Learning, 2020 – Now

- Design, Implementation and Analysis of Methods to Improve Performance of Distributed Machine Learning Systems, 2019–2020
- Implementation, Evaluation and Analysis of Fast-Slow Network Control Framework for Application-Driven Networking, 2017–2018
- Implementation, Evaluation and Analysis of Efficient, Scalable and Easily-Deployable Congestion Traffic and Control Schemes in Data Centers and Cloud, 2013–2017
- Design, Implementation and Analysis of various routing protocols optimized for Mobile Ad-Hoc Networks (MANET) via leveraging Artificial Intelligence algorithms inspired from Ant Colonies, 2008–2012
- Implementation of a complete system for enabling video calls over Bluetooth and Internet using C# as the back-end server and J2ME as the mobile front-end, 2007

Supervision

2025-Now **PostDoc - QMUL**, *Large-Scale Agentic AI Workflow and Systems*

2024-2025 **PostDoc - QMUL**, *KUber: Knowledge Delivery System for Machine Learning at Scale*

2025-Now **PhD - QMUL**, *Structured Fine Tuning of Foundation Models*

2025-Now **Visiting PhD - UCAS/QMUL**, *Efficient Multi-Modal Small Object Detection*

2025-2025 **Visiting PhD - UAEU/QMUL**, *Communication-Efficient and Fair Federated Mixture-of-Experts*

2025-Now **PhD - QMUL**, *Towards Parameter Efficient Fine Tuning of Generative AI and LLMs*

2024-Now **PhD - QMUL**, *Optimized Networking for Decentralized Federated Learning*

2023-Now **PhD - QMUL**, *Novel Optimizations for Large Audio Models (LAMs)*

2021-Now **PhD - QMUL**, *Degradation detection of video streaming using ML and Digital Twin*

2025-Now **PhD - CoSup - KFUPM**, *Towards Network-Optimized Federated Continual Learning for Intelligent Transportation Systems*

2023-Now **PhD - CoSup - HKUST**, *ML Congestion Control in SDN-based Data Center Networks*

2021-Now **PhD - CoSup - Strathmore**, *Explainable AI for Federated Biomedical Learning*

2023-Now **PhD - CoSup - Strathmore**, *Autonomous Classification Using Enhanced Federated CRNNs and Denoising Autoencoders*

2025-Now **Masters by Research - African Masters Of Machine Intelligence Program**, *Efficient Co-Optimisation of Federated Learning and Unlearning In Diverse Learning Settings*

2023-2024 **MSc**, *Enhancing Privacy of Decentralized Federated Learning in Healthcare*

2023-2024 **MSc**, *Evaluation of Latency for Real-Time Data Processing of Streaming Data*

2023-2024 **MSc**, *Comparative Analysis of Federated Transfer Learning Algorithms*

2023-2024 **MSc**, *Evaluation of Applications for Federated Transfer Learning*

2022-2023 **MSc**, *KubSmart - Kubernetes pod resources optimizer using Reinforcement learning*

2022-2023 **MSc**, *Multi-Target Domain Adaptation with Federated Learning*

2022-2023 **MSc**, *A Comparative Study of Centralised and Decentralised Fraud Detection Approaches*

2022-2023 **MSc**, *Federated Learning in Household Income Prediction*

2024-Now **Intern - QMUL**, *FedAgent: A Benchmark of Agent Frameworks of various Federated Learning Algorithms*

2022-2023 **Intern - QMUL**, *Energy-Aware Methods for Federated Learning on Battery-limited Clients*

2022-2023 **Intern - QMUL**, *Optimizing Distributed ML for Audio Models*

2020-2022 **Intern - QMUL**, *Novel Optimization for Efficient and Robust Federated Learning*

2021 **MS/PhD - KAUST**, *Mitigating Device Heterogeneity in Federated Learning via Asynchronous Stale Updates*

2021 **MS/PhD - KAUST**, *Prioritizing Participant Selection for Efficient Federated Learning*

2020 **MS/PhD - KAUST**, *Identifying the Limits of Gradient Sparsification Methods for Distributed Machine Learning*

2020 **Research Intern - KAUST**, *Study of Fairness and Bias in Federated Learning settings*

2020 **Research Intern - KAUST**, *An Efficient Compression Technique to Reduce Communication in Distributed Deep Learning*

2019 **MS/PhD - KAUST**, *Survey and Empirical Analysis of Compressed Communication for Distributed Deep Learning*

2019 **MS/PhD - KAUST**, *Theoretical and Empirical Analysis of Layerwise and Whole-Model Compressed Communication Methods in Distributed Machine Learning*

2019 **Research Intern - KAUST**, *Energy-Efficiency of Hardware Offloading: Case-Study on Distributed Machine Learning*

2019 **Research Intern - KAUST**, *Scaling Distributed Machine Learning with In-Network Aggregation using Smart NICs*

2019 **Research Intern - KAUST**, *Accelerating Distributed Deep Learning with Adaptive Compression and Communication Scheduling*

2018 **Research Intern - Huawei Research**, *Leveraging Programmable Data Plane to Accelerate Distributed Applications*

2018 **Research Intern - Huawei Research**, *An Online Learning Multi-Path Selection Framework for Multi-path Transmission Protocols*

2018 **Research Intern - Huawei Research**, *Implementation of an SDN-based Fast-Slow Control system to Realise an Operational Prototype of the Application-Driven Networking (ADN) Framework*

2022-Now **FYPs Undergraduate Students - Queen Mary University of London**, *Resume4All: a simulated Resume Builder using Speech-to-Text technologies for the visually impaired, Hybrid Adaptive Intrusion Detection System, Hobby Trader: A web app that lets users trade items to find their new passion, Qira'ah: Online Web Quran Memorization Platform*

2007-2013 **FYPs Undergraduate Students - Assiut University**, *Management System for controlling Wireless Access Points, HoneyPot Server Application, WiiMote Body Tracking & Robot Control System, Steganography Application to hide data in images and videos, Remote Desktop Control using Mobile Phones, Mobile Application in Traffic Service, Tourist Heaven - a tourist social networking application and Egyptian tourism company web system*

Honors, Awards and Scholarships

2024 **Best Student Paper award**, *Federated Learning Workshop of International Joint Conference on Artificial Intelligence (IJCAI)*

2013–2017 **Hong Kong PhD Fellowship (HKPFS) award**, *HK Research Grants Council*

2013–2017 **HKPFS research travel grant award**

2017 **Student Participation Grant**, *Local Computer Networks (IEEE LCN)*, IEEE CompSoc

2015 **Travel Grant award**, *Global Communications (Globecom) conference*, IEEE ComSoc

2007 **FYP sponsorship award**, *Ministry of Telecommunications*, Egypt

2003-2007 **Undergraduate Distinction award**, *for TGA of 85%-above*, Assiut University

2003–2007 **Dean's Honors**, *TGA of 85%+*, Faculty of Computers and Information, Assiut University

Programming, Presentation, Modeling and System Skills

Presentation Power Point, Beamer

Typography LaTeX, Microsoft office

AI/ML	Tensorflow, PyTorch, Distributed ML, Federated Learning (FedScale/Flower), RAY, Horovod, BytePS, WANDB
Modeling	Mathematical, Queueing theory, MatLab, Simulink
Info. Extract	Awk, Gnuplot, Matplotlib, Pandas, Bokeh, Perl, Excel, SPSS
Simulation	NS-2, NS-3, OPNET Modeler, Mininet
Programming, Web & DB	C, C++, Java, Python, C#, Git, Network Programming, SDN Applications, Ryu SDN Controller, P4/Tofino, Verilog, Tcl, shell scripting, HTML, PHP, SQL Server, Oracle DB
System Prototyping	Linux Kernel Modules, NetFilters, TCP/IP Stack, RDMA/RoCE/PFC, NetFPGA, Kubernetes, Kprobes, Open vSwitch, OVN, OpenFlow, OpenStack, DPDK, JUJU, CONDA, Ubuntu MASS, Broadcom OpenNSL & OFDPA API, Amazon EC2, Microsoft Azure
Virtualization	KVM, Qemu, Xen Hypervisor, Virtual Box
OS	Linux (Desktop/Server), Windows (Pro/Server), MacOS, Open Network Linux, SONiC

Language Proficiencies

Arabic	Native	*Listening, Reading, Speaking and Writing*
English	Fluent	*Listening, Reading, Speaking and Writing*

Professional Membership

IEEE	IEEE and IEEE ComSoc Society Regular Member
ACM	ACM Regular Member
USENIX	USENIX Regular Member
CISCO	CISCO Networking Academy Certified Instructor
Comp Soc	Hong Kong Computer Society Member

Professional Courses and Certification

Nvidia	NVIDIA training: Data Science at Scale
Nvidia	Nvidia-HKUST (DBI) Joint Deep Learning Workshop
Cisco	Cisco Certified Networking Associate (CCNA)
Oracle	Oracle Database Administration (Oracle DBA)

Surplus Courses

QMUL	PGCAP - ADP7216 - Learning and Teaching in Higher Education	
	PGCAP - ADP7217 - Learning and Teaching in the Disciplines	
	PGCAP - ADP7218 - Curriculum Design	
	PGCAP - ADP7219 - Action (Practitioner) Research	
KAUST	Industrial Course on Deep Learning	
HKUST	ELEC4320 - FPGA-based Design	ELEC4010G - Control System Design
	COMP4511 - System and Kernel Programming in Linux	
	COMP6611A - Data Center Networks and Cloud Computing	
	COMP6611B - Cloud Computing and Data Analysis Systems	
	FINA6900N - Startup Financing and Operations	
	IELM5570 - Network Optimization in Transport Systems	
Stanford	CVX101 - Convex Optimization	
MIT	6.00.1x - Introduction to Computer Science and Programming Using Python	
UPValencia	DC201x - Dynamics and Control	

Microsoft	DAT202.1x - Processing Big Data with Hadoop in Azure HDInsight

Professional Development Courses

QMUL	Challenging Unconscious Bias	Equality and Diversity Briefing
	Anti Bribery Essentials	Safeguarding Essentials
	GDPR for Staff	Cyber Security Training
KAUST	Scientific Writing	Communicating with Confidence
	Effective Scientific Writing	Research Communication Skills
	The Art and Science of Communication	Proven Techniques for Technical Communication
	Conveying messages with graphs	Making the most of your presentation
	The art and science of communication	Proven techniques for technical communication
HKUST	Effective Teaching Skills	Marking & Grading
	High-Tech Entrepreneurship	Understand the World of Work
	What Takes to be a Good Researcher	Conducting Labs
	Effective Presentation for Teaching	How to Write a Journal Paper
	How to Write CS Papers	How to Get Published
	Research ethics: Communities, choices, and values	
	Balancing Time between TA Duties and Research	
	Presenting Myself Through a Winning Profile	
AUN	Effective and Efficient Presentation	Academic Work and Research Ethics
	Scientific Publishing	Teaching Methodologies and Skills
	Credit Hour System	Time and Meeting Management
	Quality Assurance of Education Process	
	Communication Skills for Different Educational Approaches	

Voluntary Services

Editor	Frontiers in HPC on the research topic of HPC for AI in Big Model Era
Program Chair	1st International Workshop on Federated Edge AI Systems (FedEdgeAI) co-located with IEEE ICDCS, Glasgow, UK, 2025
	2nd International Workshop on Networked AI Systems (NetAISys) co-located with ACM MobiSys, Tokyo, Japan, 2024
	5th International Workshop on Embedded and Mobile Deep Learning (EMDL) co-located with ACM MobiSys, Virtual Online, 2021
	KAUST-NeurIPS Workshop on Advances of Machine Learning, KAUST, 2019
Tutorial	Distributed Deep Learning Clinic, KAUST, Saudi Arabia, 2020
	Data Analytics in the Cloud in the International BioDialog Project, Exhibition and Hackathon on BioDiversity Informatics, Egypt, 2018
Preview	Congestion Control Session, ACM SIGCOMM, 2022
Organizing Committee	ACM International Conference on emerging Networking EXperiments and Technologies (CoNEXT), Hong Kong, 2025
	ACM International Conference on emerging Networking EXperiments and Technologies (CoNEXT), Los Angeles, California, USA, 2024
Reviewer	ACM/IEEE Transactions on Networking (ACM/IEEE ToN)

	IEEE Transactions on Mobile Computing (IEEE TMC)
	IEEE Transactions on Neural Networks and Learning Representation (IEEE TLNNLS)
	IEEE Internet of Things Journal (IEEE IoTJ)
	IEEE Journal on Selected Areas in Communications (IEEE JSAC)
	IEEE Transactions on Information Forensics and Security (IEEE TIFS)
	IEEE Transactions on Cloud Computing (IEEE TCC)
	IEEE Transactions on Network and Service Management (IEEE TNMS)
	IEEE Transactions on Intelligent Transportation Systems (IEEE ITS)
	Proceeding of the IEEE
	IEEE Transaction on Machine Learning in Communications and Networking (TMLCN)
	IEEE Access
	ACM Transactions on Modeling and Performance Evaluation of Computing Systems
	Journal of Computer Networks, Elsevier
	Journal of Computer Communications, Elsevier
	Journal of Future Generation Computer Systems, Elsevier
	Journal of King Saud University - Computer and Information Sciences, Elsevier
	Journal of Computer Standards and Interfaces, Elsevier
	Journal of Telecommunication Systems, Springer
TPC/Reviewer	ACM Conference on emerging Networking EXperiments and Technologies (ACM CoNEXT)
	IEEE International Conference on Distributed Computing Systems (IEEE ICDCS)
	International Conference on Machine Learning (ICML)
	International Conference on Representation Learning (ICLR)
	ACM The Web Conference (WWW)
	IEEE Conference on High-Performance Switching and Routing (IEEE HPSR)
	IEEE Vehicular Technology Conference (IEEE VTC)
	USENIX Annual Technical Conference (ATC)
	AAAI Conference On Artificial Intelligence (AAAI)
	IEEE Conference on Network Protocols (IEEE ICNP)
	IEEE International Performance Computing and Communications Conference (IPCCC)
	IEEE Conference on Local Computer Networks (LCN)
	ACM Conference on Modeling and Simulation of Wireless and Mobile System (MSWiM)
	Workshop on Machine Learning for Software Networks (NetLearn), IEEE NetSoft
	ACM Workshop on Machine Learning and Systems (EuroMLSys), ACM EuroSys
	ACM Workshop on Data Privacy and Federated Learning Technologies for Mobile Edge Networks (FedEdge), ACM MobiCom
	ACM Workshop on Distribued Machine Learning (Distribued ML), ACM CoNEXT

References - available upon request

Assoc. Prof.	Brahim Bensaou	*CSE Dept., HKUST, brahim@cse.ust.hk*
Assoc. Prof.	Marco Canini	*CEMSE Division, KAUST, macro@kaust.edu.sa*
Prof.	Steve Uhlig	*School of EECS, QMUL, steve.uhlig@qmul.ac.uk*

Publication List-see Google Scholar

Thesis

- **Ahmed M. Abdelmoniem**, **"On Improving the Performance of TCP Applications in Public Cloud Networks"**. Ph.D. Thesis, HKUST, Hong Kong, `https://lbezone.ust.hk/bib/991012554564103412`, 2017.
- **Ahmed M. Abdelmoniem**, **"Routing Optimization of Mobile AD-HOC Networks Based on Ant Colony Algorithms"**. M.Sc. Thesis, Assuit University, Egypt, `http://www.aun.edu.eg/thesis_files/4341.pdf`, 2012.

International Refereed Journal Publications

- **Ahmed M. Abdelmoniem** and Yuchen Zhao. **"Knowledge Routing for Decentralized Learning"**, in *IEEE Transactions on Intelligent Systems, 2025.*
- Qilei Li, Pantelis Papageorgiou, Gaoyang Liu, Mingliang Gao, Linlin You, Chen Wang, **Ahmed M Abdelmoniem**. **"Mitigating malicious model fusion in federated learning via confidence-aware defense"**. in *Information Fusion, Elsevier, 2025.*
- Jyoti Prakash Sahoo, Binayak Kar, **Ahmed M Abdelmoniem**, Dimitris Chatzopoulos. **"Choir-IDS: A federated learning framework for fidelity-calibrated explainable intrusion detection system for edge-IoT networks"**. in *Information Fusion, Elsevier, 2025.*
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- **Ahmed M. Abdelmoniem "Towards Mitigating Device Heterogeneity in Federated Learning via Adaptive Model Quantization"**. *Proceedings of EuroMLSys workshop at ACM European Conference on Computer Systems (ACM EuroSys), Virtual Conference, Apr 2021.*
- **Ahmed M. Abdelmoniem "An Efficient Statistical-based Gradient Compression Technique for Distributed Training Systems"**. *Proceedings of the International Conference on Machine Learning and Systems (MLSys), Virtual Conference, Apr 2021.*
- **Hengky Susanto and Ahmed M. Abdelmoniem**. **"Reducing Latency in Multi-Tenant Data Centers via Cautious Congestion Watch"**. *Proceedings of 49th ACM International Conference on Parallel Processing - ICPP, Virtual Conference, 2020.*
- **Ahmed M. Abdelmoniem**. **"Taming Latencies in Data Center Networks via Active Congestion-Probing"**. *IEEE ICDCS 2019, Dallas, Texas, USA, July 2019.*
- **Ahmed M. Abdelmoniem**. **"On Network Systems Design: Pushing the Performance Envelope via FPGA Prototyping"**. *IEEE ITCE*, Aswan, Egypt, 2nd Feb 2019.
- **Ahmed M. Abdelmoniem**. **"Hands-on Tutorial on Data Analytics in the Cloud"**. *The International BioDialog Project, Exhibition and Hackathon on BioDiversity Informatics*, Egypt, Nov, 2018.
- **Ahmed M. Abdelmoniem**. **"Curbing Timeouts for TCP-Incast in Data Centers via A Cross-Layer Faster Recovery Mechanism"**. *IEEE INFOCOM*, Honolulu, HI, April 2018.
- **Ahmed M. Abdelmoniem**. **"Enforcing Transport-Agnostic Congestion Control via SDN in Data Centers"**, In *IEEE LCN*, Singapore, Oct 2017.
- **Ahmed M Abdelmoniem**. **"SICC: SDN-based Incast Congestion Control for Data Centers"**. *IEEE ICC*, Paris, France, May 2017.
- **Ahmed M. Abdelmoniem**. **"HyGenICC: Hypervisor-based generic IP congestion control for virtualized data centers"**. *IEEE ICC*, Kuala Lumpur, Malaysia, May 2016.
- **Ahmed M. Abdelmoniem**. **"Incast-Aware Switch-Assisted TCP Congestion Control for Data Centers"**. *IEEE GlobeCom*, San Diego, USA, Dec 2015.

Poster Presentations

- Abadhan S. Sabyasachi, H M Dipu Kabir, **Ahmed M. Abdelmoniem**, Subrota K. Mondal. **"A Resilient Auction Framework for Deadline-Aware Jobs in Cloud Spot Market"**. *IEEE 36th Symposium on Reliable Distributed Systems (SRDS)*, 6-Pages Hong Kong, Sept 2017.

Invited Abstracts/Keynotes/Talks

- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *Data Intelligence and Architecture Summit, Warsaw, Poland, Nov. 2025*
- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *Hangzhou University of Science and Technology, Wuhan, China, Oct. 2025*
- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *Central China Normal University, Wuhan, China, Oct. 2025*
- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *Nanjing University, Nanjing, China, Oct. 2025*
- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *British University of Egypt (BUE), Cairo, Egypt, Aug. 2025*
- **Ahmed M. Abdelmoniem**, **"Advancing Decentralised AI: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *Universitat Rovira i Virgili (URV), Tarragona, Spain, June. 2025*
- **Ahmed M. Abdelmoniem**, **"Decentralised AI for Healthcare: Towards Scalable, Adaptive, Client-Centric Learning Systems"**. *University of Barcelona, Barcelona, Spain, June. 2025*
- **Ahmed M. Abdelmoniem**, **"Efficient and Reliable Systems for Machine Learning at Scale"**. *2025 Huawei European Workshop of Trustworthy Technology and Engineering, Huawei Grenoble Research Center, France, Jan. 2025*
- **Ahmed M. Abdelmoniem**, **"Deep Learning and LLM Training: Quality & Reliability From the lenses of Distributed/Federated ML"**. 24^{th} *IEEE International Conference on Quality, Reliability, and Security (QRS) Conference, Cambridge, UK, June. 2024*
- **Ahmed M. Abdelmoniem**. **"Towards Practical and Efficient Federated Learning"**. *The Intelligent Methods, Systems, and Applications (IMSA) Conference, Cairo, Egypt, Jul. 2023*
- **Ahmed M. Abdelmoniem**. **"AI and Edge Technologies for Fostering SDGs"**. *International Conference on SUSTAINABILITY: Recent developments in research and teaching towards the United Nations Sustainable Development Goals, Online, Jun. 2023*
- **Ahmed M. Abdelmoniem**. **"Towards Practical and Efficient Federated Learning Systems: Challenges and Future Directions"**. *Institute for Communication Systems (ICS) Semminar, University of Surrey, May. 2023*
- **Ahmed M. Abdelmoniem**. **"REFL: Resource-Efficient Federated Learning"**. *MobiUK workshop, Lancaster, UK, May. 2023*
- **Ahmed M. Abdelmoniem**. **"Towards Practical and Efficient Federated Learning Systems"**. *Institute for Computing Systems Architecture (ICSA) Colloquium, University of Edinburgh, Oct. 2022*
- **Ahmed M. Abdelmoniem**. **"Towards Practical and Efficient Federated Learning Systems"**. *School of Computing Group Seminar, Imperial College London, June. 2022*

- **Ahmed M. Abdelmoniem**. **"Distributed Deep Learning Clinic"**. *KAUST-NeurIPS meet-up workshop, Saudi Arabia, Dec. 2019*
- **Ahmed M. Abdelmoniem**. **"Data Analytics in the Cloud (hands-on tutorial)"**. *The BioDialog Project: Exhibition and Hackathon on BioDiversity Informatics, Assiut University, Egypt, Nov. 2018*
- **Ahmed M. Abdelmoniem**. **"VRC: Fast and Slow Control for Bandwidth Guarantee and Bounded-Delay in Data Centers"**. *Joint Workshop among Huawei's Research Labs and Academic Advisory Board*, Beijing, Mar. 2018.
- **Ahmed M. Abdelmoniem**. **"Improving Applications' Performance in the Cloud and the Road toward Application Driven Networking"**. *Invited Talk, School of Science and Technology, Singapore University of Social Sciences (SUSS)*, Singapore, Nov. 2017.
- **Ahmed M. Abdelmoniem**. **"Cloud Networking: Current Trends, Problems and Some Solutions"**. *Keynote Speech* 7^{th} *IEEE International Conference on Intelligent Computing and Information Systems (IEEE ICICIS)*, Cairo, Egypt, Jan. 2016.

Technical Reports

- Hang Xu, Chen yu-ho, **Ahmed M. Abdelmoniem**, Aritra Dutta, Elhoucine Bergou, Konstantinos Karatsenidis, Marco Canini, Panos Kalnis, **"Compressed Communication for Distributed Deep Learning: Survey and Quantitative Evaluation"**. *Tech. Rep. KAUST.* `http://hdl.handle.net/10754/662495`.
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"Switch-based Schemes for TCP Performance Enhancement in Data Centers: Design, Synthesis and Evaluation"**. Tech. Rep. HKUST-CS17-03.
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"End-host Timely TCP Loss Recovery via ACK Retransmission in Data Centres"**. Tech. Rep. HKUST-CS17-02.
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"Control Theory Based Hysteresis Switch for Congestion Control in Data Centers"**. Tech. Rep. HKUST-CS17-01.
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"SDN-based Generic Congestion Control Mechanism for Data Centers: Implementation and Evaluation"**. Tech. Rep. HKUST-CS16-02
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"SICC: SDN-based Incast Congestion Control Framework for Data Centers: Implementation and Evaluation"**. Tech. Rep. HKUST-CS16-01.
- **Ahmed M. Abdelmoniem** and Brahim Bensaou, **"Generic Hypervisor-based congestion control for data centers: Implementation and evaluation"**. Tech. Rep. HKUST-CS15-03.

PrePrints

- Qilei Li, **Ahmed M. Abdelmoniem**. A **"Mitigating Malicious Attacks in Federated Learning via Confidence-aware Defense"**. *arXiv:2408.02813, Aug 2024.*
- Chen, S., You, L., Liu, R., Yu, S., **Ahmed M. Abdelmoniem**. **"Federated Knowledge Transfer Fine-tuning Large Server Model with Resource-Constrained IoT Clients"**, *arXiv:2407.05268, Jul, 2024*
- Mohammed Aljahdali, **Ahmed M Abdelmoniem**, Marco Canini, Samuel Horváth. **"Flashback: Understanding and Mitigating Forgetting in Federated Learning"**, *arXiv:2402.05558, Feb, 2024.*
- **Ahmed M. Abdelmoniem** and Brahim Bensaou. A **"FairQ: Fair and Fast Rate Allocation in Data Centers"**. *arXiv:2401.04850, Jan 2024.*
- **Ahmed M. Abdelmoniem**. **"Leveraging The Edge-to-Cloud Continuum for Scalable Machine Learning on Decentralized Data"**, *arXiv:2306.10848, Jun, 2024.*

- **Ahmed M. Abdelmoniem**, Atal Narayan Sahu, Marco Canini, and Suhaib A. Fahmy. **"Resource-efficient federated learning"**, *arXiv:2111.01108, Nov, 2021.*
- Atal Narayan Sahu, Aritra Dutta, **Ahmed M Abdelmoniem**, Trambak Banerjee, Marco Canini, Panos Kalnis. **"Rethinking gradient sparsification as total error minimization"**, *arXiv: 2108.00951, Aug, 2021*
- **Ahmed M. Abdelmoniem**, Pantelis Papageorgiou, Chen-yu Ho, Marco Canini, Muhammed Bilal. **"On the Impact of Device and Behavioral Heterogeneity in Federated Learning"**. *arXiv:2102.07500, Feb. 2021.*
- **Ahmed M. Abdelmoniem**, Ahmed Elzanaty, Mohamed Slim-alouini, Marco Canini. **"An Efficient Statistical-based Gradient Compression Technique for Distributed Training Systems"**. *arXiv:2101.10761, Jan 2020.*
- **Ahmed M. Abdelmoniem** and Brahim Bensaou. A **"Design and Implementation of Fair Congestion Control for Data Centers Networks"**. *arXiv:2012.00339, Dec 2020.*