Hadeel Albahar

Assistant Professor
Department of Computer Engineering
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🎓 Hadeel Albahar

Research Interest

Systems for ML, ML for Systems, and High Performance Computing. I am currently interested in optimizing the performance of systems for ML.

Education

2018-2023   **Ph.D. in Computer Engineering**, *Virginia Polytechnic Institute and State University (Virginia Tech)*, Blacksburg, Virginia, USA.
Dissertation: Optimizing Systems for Deep Learning Applications.
Advisor: Ali R. Butt.

2014-2015   **M.S. in Computer Engineering**, *Columbia University in the City of New York*, NY, USA.

2007-2011   **B.S. in Computer Engineering**, *Kuwait University*, Khaldiya, Kuwait.
Distinction with Class Honors

Work Experience

09/25-09/26   **Visiting Researcher**, *Computer Science Department, Virginia Tech*, Blacksburg, VA.

2023-present   **Assistant Professor**, *Computer Engineering Department, Kuwait University*, Sabah Al-Salem University City, Kuwait.
Committee service:
- Engineering Ethics Committee - Coordinator (Fall'24, Spring'25)
- Engineering Design Expo Project Assessment Committee - Member (Spring'24, Spring'25)
- CpE Cultural and Social Activities and Scientific Lectures Committee - Coordinator (Fall'24, Spring'25)
- CpE Student Affairs - Member (Fall'23, Spring'24)
- CpE Programming Fundamentals Teaching Area Group - Member (Fall'23, Spring'24)
- CpE Design Teaching Area Group - Member (Fall'24, Spring'25)

2012/2016   **Technical Support Engineer**, *Kuwait Foundation for the Advancement of Sciences (KFAS)*, Kuwait City, Kuwait.
Technical support for Kuwait e Award. I organized submissions, facilitated demonstrations, coordinated with the panel of judges, and mentored a new technical support engineer.

2012-2013   **Intern**, *EXP*, Chicago, Illinois, USA.
A six-months internship program at the North American consulting firm 'exp US services Inc.' in Chicago, IL, USA in the Information Systems (IS) department as part of the Kuwait Fund for Arab Economic Development Training Program. Skills obtained: HTML, Active Server Pages (ASP), Microsoft SQL Server, SQL Server Reporting Services (SSRS), SharePoint

Teaching Experience

2023-present   **Instructor**, *Department of Computer Engineering*, Kuwait University.
- CpE 363: Introduction to Embedded Systems (Fall'23, Summer'24, Spring'25, Summer'25)
- CpE 445: Operating System Principles (Fall'23, Spring'24)
- ENGR 310: Engineering Ethics (Spring'24, Fall'24)
- CpE 262: Fundamentals of Digital Logic (Fall'24)

Fall 2021	**Graduate Teaching Assistant**, *Department of Electrical and Computer Engineering*, Virginia Tech.

- ○ ECE 3524: Introduction to Unix for ECE — Lecture; Office hours; scripting; grading

Spring 2012	**Teaching Assistant**, *Department of Computer Engineering*, Kuwait University.

- ○ CPE 264: Digital Logic Laboratory — laboratory lectures; office hours; grading
- ○ CPE 456: Computer Networks II — Lectures; office hours; grading

Proposal Grants

Spring 2025	**Research Initiation Grant (RIG)**

Funding Agency: Kuwait University

Investigator(s): Hadeel Albahar (PI)

Title: Optimizing Resource Scheduling and Storage Efficiency In MLaaS for Large-Scale Deep Learning Workloads.

Funding Amount: 2000 KD

Publications

Journal Articles

TOS'24   Nannan Zhao, Muhui Lin, **Hadeel Albahar**, Arnab K. Paul, Zhijie Huang, Subil Abraham, Keren Chen, Vasily Tarasov, Dimitrios Skourtis, Ali Anwar, and Ali R. Butt. *An End-to-End High-Performance Deduplication Scheme for Docker Registries and Docker Container Storage Systems*. doi.org/10.1145/3643819

TACO'22   Peng Xu, Nannan Zhao, Jiguang Wan, Wei Liu, Shuning Chen, Yuanhui Zhou, **Hadeel Albahar**, Hanyang Liu, Liu Tang, and Zhihu Tan. *Building a fast and efficient LSM-tree store by integrating local storage with cloud storage*. doi.org/10.1145/3527452

TPDS'20   Nannan Zhao, Vasily Tarasov, **Hadeel Albahar**, Ali Anwar, Lukas Rupprecht, Dimitrios Skourtis, Arnab K. Paul, Keren Chen, and Ali R. Butt. *Large-Scale Analysis of Docker Images and Performance Implications for Container Storage Systems*. doi.org/10.1109/TPDS.2020.3034517

DII'18   IA Shehata Elhelf, **H Albahar**, U Shah, A Oto, E Cressman, M Almekkawy. *High intensity focused ultrasound: The fundamentals, clinical applications and research trends*. doi.org/10.1016/j.diii.2018.03.001

Conference Proceedings

CCGrid'22   **Hadeel Albahar**, Shruti Dongare, Yanlin Du, Nannan Zhao, Arnab K. Paul, and Ali R. Butt. SCHEDTUNE: A Heterogeneity-Aware GPU Scheduler for Deep Learning. doi.org/10.1109/CCGrid54584.2022.00079

Cluster'21   Peng Xu, Nannan Zhao, Jiguang Wan, Wei Liu, Shuning Chen, Yuanhui Zhou, **Hadeel Albahar**, Hanyang Liu, Liu Tang, Changsheng Xie. Building A Fast and Efficient LSM-tree Store by Integrating Local Storage with Cloud Storage. doi.org/10.1109/Cluster48925.2021.00032

ATC'20   Nannan Zhao, **Hadeel Albahar**, Subil Abraham, Keren Chen, Vasily Tarasov, Dimitrios Skourtis, Lukas Rupprecht, Ali Anwar, and Ali R. Butt. DupHunter: Flexible High-Performance Deduplication for Docker Registries. dl.acm.org/doi/10.5555/3489146.3489199

Cluster'19   Nannan Zhao, Vasily Tarasov, **Hadeel Albahar**, Ali Anwar, Lukas Rupprecht, Dimitrios Skourtis, Amit S. Warke, Mohamed Mohamed, and Ali R. Butt. Large-Scale Analysis of the Docker Hub Dataset. doi.org/10.1109/CLUSTER.2019.8891000

NER'17   Mohamed Almekkawy, James Cunningham, Yi Song, **Hadeel Albahar**, Thyagarajan Subramanian. In-vivo transcranial ultrasound imaging of induced Substantia Nigra hyperechogenicity using adaptive sparse Third Order Volterra Filter. doi.org/10.1109/NER.2017.8008366

Posters/Abstracts

KICLS'25   Maryam Khafagy, **Hadeel Albahar**. Guided vs. Banned AI in Higher Education: Psychological and Ethical Perspectives. Accepted for presentation at the 4th Kuwait International Conference on Life Sciences 2025, Kuwait, Nov 2025.

STM'18   Islam Elhelf, Hadia Abdelaal, Abeer Almekkawy, **Hadeel Albahar**, Mohamed Almekkawy. The Emerging Role of High Intensity Focused Ultrasound (HIFU) in Cancer Immunomodulation. researchgate.net/Immunomodulation

Dissertations

PhD'23   **Hadeel Albahar**, Optimizing Systems for Deep Learning Applications. Ph.D. dissertation, Department of Electrical and Computer Engineering, Virginia Tech, U.S.A., 2023. http://hdl.handle.net/10919/114021

Talks and Presentations

Jun 2025   **Kuwait University AI and Robotics Society (KARS)**. Introduction to Linux CLI and Docker Containers.

Jan 2024   **Kuwait University AI and Robotics Society (KARS)**. Linux - The basics of bash scripting and terminal commands.

Awards and Honors

2024   Judge, Hour of Code, programming competition by the Computer Engineering Society (CPES) and Kuwait University AI and Robotics Society (KARS), Sabah Al-Salem University City, Kuwait.

2023   Judge, Hour of Code, programming competition by the Computer Engineering Society (CPES) and the Information Science Club (CLICKIT), Sabah Al-Salem University City, Kuwait.

2022   Student Volunteer, SCinet @ SC, Dallas, TX, USA.

2022   Grace Hopper Celebration virtual Hopper (Volunteer).

2022   GHC Student Scholarship to attend the virtual component of the Grace Hopper Celebration.

2021-2023   Member, I WILL (Inspiring Women in Lifelong Leadership) Institute, Virginia Tech.

2015   Hackathon Volunteer, the Data Science Institute at Columbia University, New York, NY.

2014   Kuwait University Scholarship recipient, Full scholarship to pursue M.S. and Ph.D. degrees.

2013   Graduate of Excellence - One of the top 10 students graduating from College of Engineering and Petroleum – Graduates of Excellence Ceremony Class of 2012/2013 under the patronage and presence of HH the Amir of Kuwait.

2012   Accepted into the Kuwait Fund For Arab Economic Development Training Program for Newly Graduated Engineers and Architects.

2008-2011   Dean's Honor list and Outstanding Students list – College of Engineering and Petroleum, Kuwait University.

Technical Skills

General   Python, Bash, git, LaTeX, Assembly, Matlab, Java, C/C++, SQL, HTML, ASP, Verilog

Systems   Linux, Docker Containers, Kubernetes, Slurm, Cloud Computing (AWS), Ray, Openwhisk

Analytics   Applied machine learning, scikit-learn, Pandas, matplotlib

Professional Service

TPC Member   DistLLM'26, REX-IO'25, HiPC'25, , IEEE Cluster'25, IPDPS'25, and REX-IO'24

Reviewer   IEEE Transactions on Computers'25, IEEE Transactions on Network Science and Engineering ('21, '22)

Sub-Reviewer	IPDPS('19 − '23), ICCD'19, ICDCS('19 − '22), BigData('19, '21), HPDC('20 − '22), IEEE Cluster('20, '21), ICS'21, ICMLA'21, SC'22, ECML PKDD'22

Mentoring Experience

Graduate Students

2021-present	Shruti Dongare, Virginia Tech
2022	Anish Reddy Ellore, Virginia Tech
2022-present	Sabiha Afroz, Virginia Tech

Undergraduate Students

2025	Maryam Khafagy, Kuwait University
2021-2022	Yanlin Du, Virginia Tech

Coursework, Workshops, and Training

Training Certificates	Oak Ridge Leadership Computing Facility (OLCF) Hands-On HPC (HPC, MPI, OpenMP, CUDA programming) on Summit Supercomputer.
Graduate Coursework	Deep learning, Information storage and retrieval, Algorithms Design, Theory of Computation, Numerical Solutions Applied to Heat Transfer and Fluid Mechanics problems, Performance Evaluation, Networks, Digital Communications, Network Security, Operating Systems, Advanced Internet Services, Big Data Analytics, Next Generation Networks, Content Distribution Networks, etc.
Workshop Certificates	Team Building and Teamwork, Communication and Presentation Skills, Self and Time Management, Feasibility Study and Business Planning, Finance for Non Financials, Problem Solving and Decision Making, Project Management for Non Managerial, Contracts and Contract Management, Value Engineering, Report Writing, Organizational Structure and Work Ethics and Behavior, Health, Safety and Environment in Engineering Projects, Negotiation Skills.
Undergraduate Coursework	Data structures and Algorithms, C++ and Java, Operating Systems, Digital logic, Embedded Systems, Circuits and Electronics series, Signals and systems, Computer Organization and Architecture, Networks series, Databases, etc.