

How AI is Transforming and Shaping the Future of Education

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Abstract: Artificial intelligence (AI) is revolutionizing higher education by affecting teaching, learning, assessment, and the skills required for future careers. AI technologies like machine learning and data analytics emerged through computer-related technologies and evolved into web-based intelligent education platforms. They now include web-based chatbots assisting or performing instructors' tasks. By leveraging these platforms, educators can tailor personalized and adaptive learning experiences adjusted to the unique needs of each of their students. Through analysis of datasets and pattern recognition, these systems offer customized recommendations to improve student motivation and engagement. Automated grading systems provide students with immediate feedback that encourages self-assessment and facilitates real-time comprehension of their strengths and flaws, thereby enabling improvement. This approach allows educators to focus more on refining curricula and enhancing teaching quality. AI also supports collaborative learning environments with intelligent tutoring systems and virtual assistants, promoting active participation, critical thinking, and problem-solving skills. However, integrating AI in education presents challenges, especially with respect to privacy and ethics. Protecting student information and guaranteeing ethical AI use are crucial. Also, over-reliance on AI can lead to passive learning experiences. Balancing AI with human instruction is essential to maintain meaningful interactions and foster deeper understanding. This keynote will delve into the multifaceted impact of AI on education, drawing on recent research and practical applications, it will emphasize the importance of considering the ethical implications and challenges of AI-based education, and will suggest that, by tackling AI's potential, educators can equip students with modern skills for their future careers.



Mounir Hamdi is the *founding* Dean of the College of Science and Engineering at Hamad Bin Khalifa University (HBKU). He is an IEEE Fellow *for contributions to design and analysis of high-speed packet switching*, which is the highest research distinction bestowed by IEEE.

As founding Dean of the College of Science and Engineering, Dr. Hamdi led the foundation of 15 graduate programs and 4 undergraduate programs and all the associated research labs and activities. Before joining HBKU, he was Chair Professor at the Hong Kong University of Science and Technology (HKUST), and the Head of the Department of Computer Science and Engineering. He received the B.S. degree in Electrical Engineering - Computer Engineering minor (with distinction) from the University of Louisiana in 1985, and the MS and the PhD degrees in Electrical Engineering from the University of Pittsburgh in 1987 and 1991, respectively.

He was a faculty member in the Department of Computer Science and Engineering at the Hong Kong University of Science and Technology since 1991, where he was a founding member of the University. He became the Head and Chair Professor of the Department. Under his Headship tenure, his Department was ranked 13th in the world by QS World Ranking and 21st in the world by the Academic Ranking of World Universities (ARWU). He was the Director of the Computer Engineering Program, Director of the Master of Science in Information Technology, and Director of the Computer Networking Research Lab. He was involved with HKUST administration such as the University Senate, University Council, and University Administration Committee. In 1999 to 2000 he held visiting professor positions at Stanford University, USA, and the Swiss Federal Institute of Technology, Lausanne, Switzerland as well as Honorary Professor in various Chinese Universities such Nanjing University and Chinese Southeast University. His general area of research is in high-speed wired/wireless networking in which he has published more than 500 research publications, received numerous research grants, and graduated more 50 MS/PhD students. He is listed amongst the top 2% researchers world-wide by Stanford University with an H-index of 63. In addition, he has frequently consulted for companies and

governmental organizations in the USA, Europe and Asia. He is also a frequent keynote speaker in International Conferences and Forums on matters related to cutting-edge research and education.

Prof. Hamdi is/was on the Editorial Board of various prestigious journals and magazines including IEEE Transactions on Communications, IEEE Communication Magazine, Computer Networks, Wireless Communications and Mobile Computing, and Parallel Computing as well as a guest editor of IEEE Communications Magazine, guest editor-in-chief of two special issues of IEEE Journal on Selected Areas of Communications, and a guest editor of Optical Networks Magazine. He has chaired more than 20 international conferences and workshops including The IEEE International High Performance Switching and Routing Conference, the IEEE GLOBECOM/ICC Optical networking workshop, and the IEEE ICC High-speed Access Workshop, and has been on the program committees of more than 200 international conferences and workshops. He was the Chair of IEEE Communications Society Technical Committee on Transmissions, Access and Optical Systems, and Vice-Chair of the Optical Networking Technical Committee, as well as member of the ComSoc technical activities council. He received the best paper award at the IEEE International Conference on Communications in 2009 and the IEEE International Conference on Information and Networking in 1998. He also supervised the best PhD thesis award amongst all universities in Hong Kong.

In addition to his commitment to research and professional service, he is also a dedicated teacher and renowned quality-assurance educator. He received the best 10 lecturers award (through university-wide student voting for all university faculty held once a year), the distinguished engineering teaching appreciation award from the Hong Kong University of Science and Technology, and various grants targeted towards the improvement of teaching methodologies, delivery and technology. He is frequently involved in higher education quality assurance activities as well as engineering programs accreditation all over the world.