



Trust and Transparency in AI

Dr. Kaoutar El Maghraoui, Senior Research Scientist, IBM T.J. Watson Research Center, USA

Abstract:

AI has transformed nearly every business process and industry from Finance, Energy to supply chain optimization, sales, marketing and HR. To achieve this, these businesses had to harness large amounts of data, build new team skills and coordinate business transformation across multiple teams. However, There are many barriers to delivering business value from AI in the enterprise world. Business owners resist putting AI into production because they lack trust in AI. Data scientists are in short supply but with high demand. This implies that most businesses struggle to build teams with skills in deploying and managing AI applications at scale. Moreover, the data science community still lacks standards or tools for integrating AI into enterprise IT systems and processes.

This talk lays out the challenges of adopting, operationalizing and scaling AI in the real world and describes ongoing research efforts and innovations from IBM Research to address these challenges. This includes research efforts and innovations on AI fairness, explainability, adversarial robustness, and automated AI.

Building more trustworthy, transparent and ethical AI systems is not only a research question, it's also business imperative.

Biography:

Dr. Kaoutar El Maghraoui is a senior research scientist at the IBM Research AI organization where she is focusing on innovation at the intersection of systems and artificial intelligence. Kaoutar has extensive experience and deep expertise in HPC, systems software, Cloud computing and machine learning. She co-lead IBM's Global Technology Outlook in 2017 where she worked on creating IBM's vision for the future of IT across global labs and business units focusing on IBM's AI leadership. Kaoutar has co-authored several conference and journal publications in the areas of systems research, distributed systems and high performance computing.

Kaoutar obtained a PhD degree in Computer Science in 2007 from Rensselaer Polytechnic Institute (RPI), Troy, New York and a Master's degree in Computer Networks in 2001 from Al Akhawayn University, Morocco. She was a lecturer of Computer Science in the School of Science and Engineering at Al Akhawayn University in 2001 and 2002. Kaoutar has received several fellowships and awards including the American Association of University Women fellowship, the Robert McNaughton Award for best thesis in computer science at RPI, IBM's Eminence and Excellence award for leadership in increasing Women's presence in science and technology, IBM's Tier II award for contributions to the foundational POWER software technologies and promoting these systems in Africa, and 2 IBM's outstanding

accomplishment awards for contributions to building cognitive virtual technical support . She is a senior member of ACM, IEEE Computer Society, and the Society of Women Engineers. Kaoutar is the chair of the Arab Women in Computing organization and avid supporter and active member of several women in science and technology initiatives. Dr. Kaoutar is a frequent speakers at various technical conferences.

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"A day in the life of an Artificial Intelligence and Machine Learning researcher in industrial applications"

Dr. Bouchra Bouqata, Senior Machine Learning and AI Program Manager, Amazon Robotics Research, USA

Abstract:

In this talk I will provide an overview of some key innovations and inventions in Artificial Intelligence and Machine Learning, that I made throughout my career in the areas of Industrial Assets Diagnostics, Prognostics and Reliability and Risk Management, Patient Monitoring, Logistics and Supply Chain Management. Some of these innovations were pushing research boundaries with DARPA and AFRL such as decision making at the edge of a network of assets/machines via cognitive agents. Others were directly impacting GE businesses such as an expert system that forecasted failures in advance to prevent major failures and provided automated recommendations to field technicians to maintain assets such as locomotives and wind turbines. Another very impactful work of mine was based on a challenge that AFRL (Air Force Research Lab) posted in 2013, where AFRL wanted to have a model representation of an airplane (airframe and engine) that will predict when a failure is most likely to occur and corresponding model would be airplane specific rather than fleet averages (the state of the art used by engineers). The solution I proposed, as a Principal investigator, was called "Digital Twin". The main idea was a representation/model of the airframe and the engine based on Machine learning modeling of data collected from several sensors on the airplane (airframe and engine). This unique and novel approach extensively leverages physics-based modeling of the system and fuses physics-based modeling along with data driven Machine Learning techniques.

Biography:

Dr. Bouchra Bouqata is the Senior Machine Learning and AI Product Manager at Amazon Robotics Research. Prior to that, she was senior Analytics Product Manager in the Digital Strategy organization at GE Renewable Energy and senior scientist in the Machine Learning lab at GE Global Research. Dr. Bouqata leads programs in the area of large-scale automated-intelligent analytics systems based on Machine learning and AI solutions emphasizing on solving business problems ranging from automated robotics enabled Fulfillment Network for Amazon to GE Wind and Energy Industrial Internet Big Data problems in the areas of Prognostics and Health Management, Remote and Online Monitoring and Diagnostics. Dr. Bouqata received her Ph.D. in Machine Learning and Artificial Intelligence from Rensselaer Polytechnic Institute, NY in 2006. She received several fellowships and awards including BEYA and YCWA REACH awards for outstanding achievements and GE's inclusiveness award for outstanding leadership and work. Dr. Bouqata has co-authored several conference

and journal publications and holds multiple patents in the areas of Machine Learning, Asset Prognostics and Health Management and Asset Monitoring and Diagnostics. She has organized successful panels and workshops and served as chair and invited speaker in different technical conferences such as NREL, ICCBR, NIPS, Big Data, Wind O&M, GHC and NYCWiC. She served as the Data Science track co-chair for GHC'17 and GHC'16. Bouchra is passionate about attracting, promoting and retaining Women in Computing. She is part of the leadership committee of GHC, Amazon Women Engineers, GE's Women in Technology, Arab Women in Computing (ArabWiC) and, ArabWiC Morocco. Dr. Bouqata is an active member of IEEE, AAAI, ACM-W and SWE