



The Beginning *of a* NEW ERA




Psychologist, Robert Sternberg's triarchic theory of intelligence has three components namely Practical Intelligence: the ability to get along in different contexts; Creative Intelligence: the ability to come-up with new ideas and Analytical Intelligence: the ability to evaluate information & solve problems. Human cerebrum has these three components, evolved to the extent that, the quest for that extra intelligence and extra throughput for the automation, robotics and machines have driven mankind into the new fields of AI, ML, robotics and big data science.

Industry 4.0 has paved the interleaved path of IoTs; cloud computing; data analytics and AI-ML into the culmination of an efficient manufacturing capability. At the same time, *Industry 5.0* is about to arrive at our door-steps, for the usage of robots and smart machines on a very massive scale. Indian brains have always accepted new challenges to cope-up with and to harmonize newer methods & techniques, in solving problems, to meet the requirements of our country.



BARC scientists and technologists are also on the fore-front to catch-up with the latest concepts of robotics and AI-ML. The current issue of BARC Newsletter makes everyone aware that BARC has also initiated and adopted automation-robotics-AI-ML to solve some of the critical scientific problems of the Department of Atomic Energy. At a glance, one can observe that robots & cobots have been utilized for the three-stage nuclear program, back-end fuel cycle, healthcare, security & surveillance and for unmanned operations for hazardous areas. On the other hand, AI-Deep learning-ML have been utilized to solve the challenges in the field of identification process; healthcare; astronomical science; recognition of human features and extraction of automobile features for security purpose, biological and material studies and for video analytics.



The benefits of automation have been exploited for the critical applications in nuclear, space and defense industries and for specific applications in the field of civil engineering, transport sector, pharmaceutical, chemical process and advanced studies in Physics-Chemistry-Biology. We are sure that the big data science, cloud computing and data analytics are going to play a major role in the fields of simulation & modeling for the earth and environmental science, remote-sensing, agriculture and for economy and finance too. Therefore, it is an era of facing technological challenges within and outside the domain of expertise for the benefit of mankind. Have a fruitful experience, in reading the eighteen articles, penned down by BARC scientists and engineers, where they have shared some of their latest endeavors.

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