

## NBIC, THE CONVERGING TECHNOLOGIES

**S**ince the publication of the report “Converging Technologies for Improving Human Performance, NANOTECHNOLOGY, BIOTECHNOLOGY, INFORMATION TECHNOLOGY AND COGNITIVE SCIENCE”

by National Science Foundation of United States, the term NBIC has gained a wide popularity (Roco & Bainbridge, 2003). In this report published in 2003, authors argued that the integration of these four technologies based on the developments on the nanoscale can offer significant improvement of human life styles including in the working habits, economics and humanities.

Since then, a tremendous amount of discussion has emerged to realize the potentials that these new technologies can offer to improve the human performance. Such potentials has been envisioned as improved learning capabilities, cognitive functions enhancement, augmented and extra sensory modules, and enhanced communications between people and man-machine interactions. However, the implications of such enhancements on the human performance are not well clear, and it still needs debate and discussion to envision how these new technologies should be employed.

Islamic Republic of Iran is one of the pioneers of the nanoscience and cognitive sciences especially in the Middle East and bears the onus of leading this field based on the values particular to this region. NBIC technologies can transform human lives significantly. In addition, envisioning all the cons and pros of the NBIC, right choices can be made to make the future prosperous and safe. New ideas need to be generated from the society itself and the long-term effects of such changes need to be discussed. With advancement of NBIC, topics such as free will, morality, and legal responsibility are facing new challenges and debates.

In addition, the fast progress of research in these fields is hard to monitor, particularly for one person. Frameworks need to be defined for team works, which gathers scientists from various disciplines and modalities. Fruitful interactions need to be defined to produce a vision of tomorrow. Such frameworks can lead to a revolutionary improvements in the life style and bring a golden era of humanity.

Even with today's progress of the Nano, Bio, Information technology and Cognitive science, convergence of these technologies are bringing new products and studies, which are constantly changing our paradigm of its potentials. Improved human cognition and communication, improved health care, augmented physical capabilities, and changes in group outcomes are examples of such changes. In addition, these changes can revolutionize education, health care, economy, defence, and environmental interactions.

Overall, we are approaching a revolutionary phase in the history of humanity. Careful considerations need to be envisioned to lead humanity into a successful future.

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### Reference

- Roco, M. C., & Bainbridge, W. S. (2003). Converging technologies for improving human performance: Nanotechnology, biotechnology, information technology and cognitive science. Springer.

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