# LEADING TECHNOLOGIES OF NEAR FUTURE: NANOTECHNOLOGY AND ARTIFICIAL INTELLIGENCE

Melike ŞİŞECİ ÇEŞMELİ[1]

İhsan PENÇE[2]

### Introduction

Nanotechnology is a discipline which analyses the innovations due to the dimensions of nano-sized materials [1]. Even though nanotechnology is regarded as a technology of 20th century, nanotech practices go back to ancient periods. Nanoparticles have been used in various fields such as colouring the leaded glass or fresco, production of porcelain or building construction. The well-known piece for which nanoparticle molecules were used is Lycurgus cup, a 4th century Rome cup. Thanks to nanoparticles added into glass metal, the cup has a feature of photochromism according to reflection and transmission of light that is shown in Figure 1 [2]. Richard P. Feynman's view which suggested in 1959 that "why we would not write 24-volume encyclopaedia on the top of a pinhead" has become a leading vision for today's developments in computer and storage technologies developed by nanotechnology [1]. For the first time in 1974 in a conference Norio Taniguchi used the word "Nano" meaning "dwarf" in Greece and thereby Taniguchi raised the term "Nanotechnology". The most significant technologic developments carried out after Feynman's speech are observation of nanostructures using scanning tunneling microscope by Binning and Rohrer in 1981 [3] and constituting IBM logo by packing xenon atoms in nano scale with scanning tunneling microscope by IBM company. In 1985 carbon balls were found out which were named as Fullerene totally consisting of Carbon 60 (C60) atom [4]. Since scanning tunneling microscopes were useful for measurement of only conductive materials, atomic force microscopy was developed for nonconductive materials [5]. After obtaining images in nano-size, developments continued on and moreover various works

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1    Burdur Mehmet Akif Ersoy University,Turkey, melikesiseci@mehmetakif.edu.tr.

2    Burdur Mehmet Akif Ersoy University, Turkey, ihsanpence@mehmetakif.edu.tr.

riod in so many field such as detecting nano scale data with image processing, to predict parameter efficiently, to comment the system simulation and results. When the calculation period of possible problems is taken into consideration, it becomes essential to utilize artificial intelligence techniques to shorten the time.

Artificial intelligence also needs nanotechnology to execute faster operations with more data. Thanks to nanotechnology, fast and small sized devices can be produced and magnetic data can be stored. Quantum computers can also be developed by means of nanotechnology. As a foregone conclusion of these processes, artificial intelligence searches are able to analyse with more data and analysis time period shortens.

In near future with the relationship between nanotechnology and artificial intelligence it will be observed that diseases will be cured with nano drugs, water resources will be renewable resource, data communication and security will be provided with nano devices, devices will be more durable and will not rust, heat resistant materials will be produced and small-sized computers with more powerful processor will be used.

**Keywords:** Nanotechnology, artificial intelligence, internet of things, artificial neural network.

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