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AI in Nanotechnology

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During the last decade there has been increasing use of AI tools in nanotechnology research. Current trends and future perspectives can boost AI based applications in the development of nanocomputing hardware. Nanotechnology combines the knowledge of physics, chemistry and engineering, while AI has heavily relied on biological inspiration to develop most effective paradigms such as neural networks or evolutionary algorithms. Bridging the link between nanosciences and AI can boost research in these disciplines and provide a new generation of information and communication technologies that will have a large impact in our society, providing the means so that technology and biology merge. Nanotechnology suffers the physical limitations of its working scale where the physics is completely different from that of the macroscopic world. Main issues faced in nanotechnology like, correct interpretation of the results obtained from any system or device at this scale. In such cases, the development of analytical approximations is hard, numerical simulations have become widely used to obtain accurate interpretations of experimental results. AI tools such as machine learning paradigms include approaches like artificial neural networks, a set of interconnected nodes whose connection weights are

determined through a supervised or unsupervised algorithm. AI is used in interpreting experimental techniques or assisting in the design of nano materials and instruments. Integrating the link among current nano-sciences and AI can enhance research in these scientific fields as well as provide a new generation of communication and I.T which will have a major impact in our society. Efforts have been made using AI technologies in basic and applied nano science, like in interpretation of experiments or assisting design of nano materials and instruments. In this presentation, bidirectional interaction between AI and nanotechnology will be discussed along with different uses and applications.

Reference

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