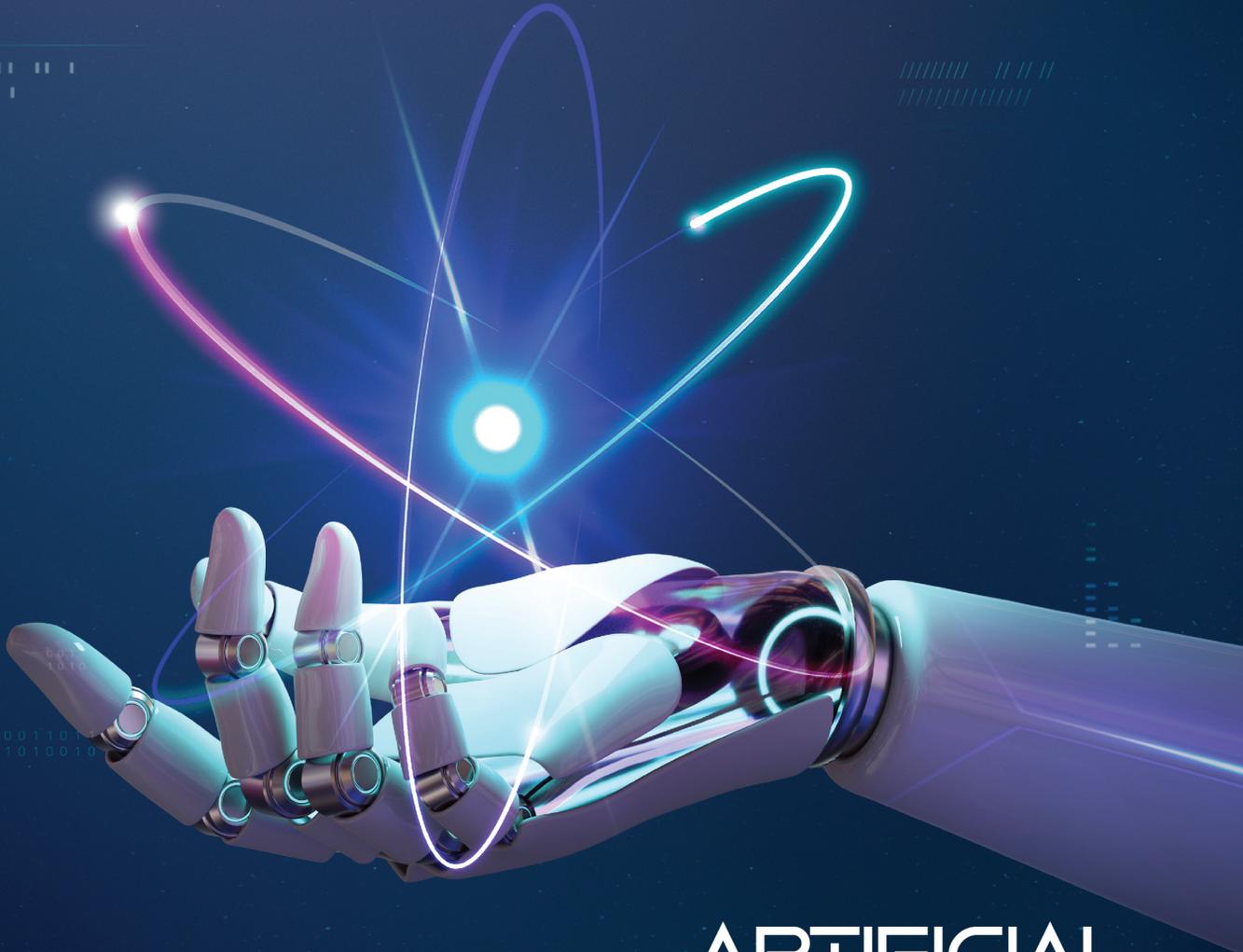


RISE

Catalysing Global Research Excellence



ARTIFICIAL
INTELLIGENCE (AI):
Embracing the Future

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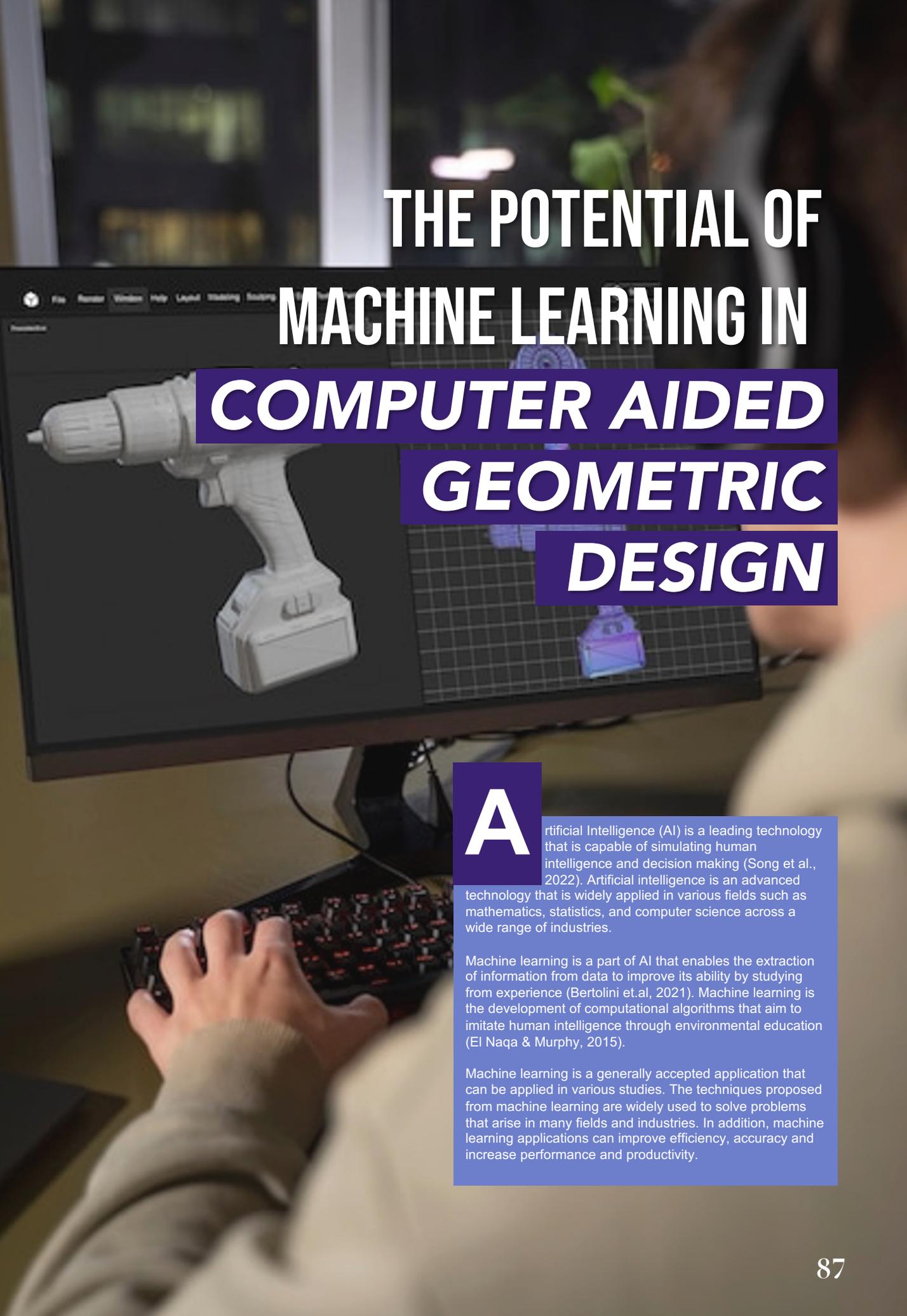
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ABOUT THE MAGAZINE

RISE Magazine is published by Office of the Deputy Vice-Chancellor (Research and Innovation) with aims to highlight a research and innovation on multidisciplinary expert of fields in UiTM. It serves as a platform for researcher to showcase their high quality and impactful findings, activities and innovative solution through publication. Contribution of these ideas come from academicians, researchers, graduates and universities professionals who will enhance the visibility of research and stride to elevate Universiti Teknologi MARA to global standards. This is an effort to promote research as a culture that is accepted by all expertise.

ABOUT UiTM

Universiti Teknologi MARA (UiTM) is a public university based primarily in Shah Alam, Malaysia. It has grown into the largest institution of higher education in Malaysia as measured by physical infrastructure, faculty and staff, and student enrollment. UiTM is the largest public university in Malaysia with numerous campuses throughout all 13 states in Malaysia. There is a mixture of research, coursework and programmes offered to the students. The Office of the Deputy Vice-Chancellor (Research and Innovation) also known as PTNCPI (*Pejabat Timbalan Naib Canselor (Penyelidikan dan Inovasi)*) serves as a *Pusat Tanggungjawab* (PTJ) for navigating the research and innovation agenda of the university to achieve UiTM's goals. The PTNCPI office strives to mobilize faculty and campuses, fostering collaboration among researchers, with the aim of transforming the University into a Globally Renowned University by 2025

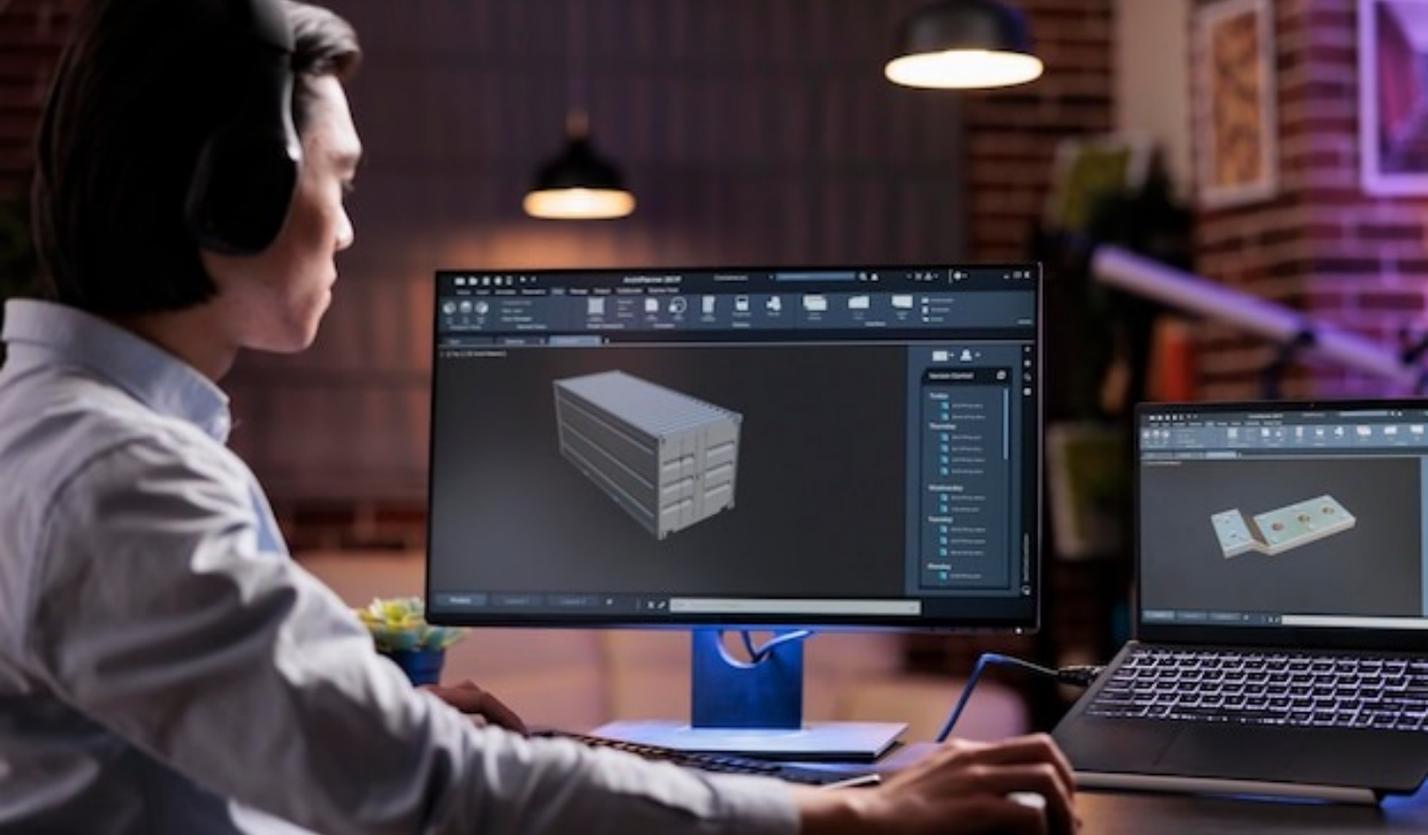
A person is seen from behind, sitting at a desk and using a computer. The monitor displays a 3D CAD model of a white power drill on a grid. The person's hands are on a keyboard. The background is a blurred office environment with a window and a plant.

THE POTENTIAL OF MACHINE LEARNING IN COMPUTER AIDED GEOMETRIC DESIGN

Artificial Intelligence (AI) is a leading technology that is capable of simulating human intelligence and decision making (Song et al., 2022). Artificial intelligence is an advanced technology that is widely applied in various fields such as mathematics, statistics, and computer science across a wide range of industries.

Machine learning is a part of AI that enables the extraction of information from data to improve its ability by studying from experience (Bertolini et.al, 2021). Machine learning is the development of computational algorithms that aim to imitate human intelligence through environmental education (El Naqa & Murphy, 2015).

Machine learning is a generally accepted application that can be applied in various studies. The techniques proposed from machine learning are widely used to solve problems that arise in many fields and industries. In addition, machine learning applications can improve efficiency, accuracy and increase performance and productivity.



Various special features of machine learning have attracted researchers to make use of the technology in their research field, including in computer aided geometric design. For instance, Kumar et.al, (2003) proposed a parameterization model with genetic algorithms to improve the accuracy of the curve construction. The construction of non-uniform B-spline curve is implemented by using parameterization from genetic algorithm. The parameterization is based on the primary parameterization. The parameter is optimized, and the knot values are optimized by using iterative optimization procedures from the available solution in genetic algorithm.

In addition, the machine learning algorithm was used to analyze facial expression recognition (Kucukoglu et.al, 2019). The study was conducted by using the Bezier curve and machine learning, which was supported with statistical evaluations on feature vectors in a machine learning algorithm. The two models of machine learning that were used in this study included the Training Phase and Testing Phase. The statistical method was applied with machine learning in order to obtain the types of emotions from a face drawn by using the Bezier curve with an analysis using statistical modelling and estimation procedure.

Another innovative approach of machine learning in computer aided geometric design was introduced by Li and Li (2020) who applied the application of machine learning in parameterization techniques by optimizing extreme machine learning to improve the non-linear curve fitting and to solve

the non-linear fitting problem. The extreme machine learning was used to train the network by assigning individual neuron parameters at $w = G^+y$ the hidden layer. The weight of the parameter for the network was determined by using the equation and single value decomposition method. The accuracy of the curve fitting was achieved by using the proposed method and some recommendations for future work focused on reducing the network size and exploring the usage of the ELM method for multiple dimensions and even sparse data fitting.

Machine learning from artificial intelligence is a new approach that researchers should explore to clarify problems in computer aided geometric design and increase the efficiency and quality of the result. According to the review of previous studies, we can conclude that machine learning possesses significant potential as an advanced technology in supporting the research in computer aided geometric design.



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