

E - NEWSLETTER

By The AI Research Centre, Woxsen University

■ METAVERSE ODYSSEY

The WoxsenVerse Odyssey brings together innovation and education in an engaging awareness drive to promote SDGs.

■ ARTIFICIAL NEURON

An attempt at developing the artificial model of a biological neuron using semiconductor devices

■ 4TH AIKP CONFERENCE

Keynote speakers selected for the 4th AKIP conference being held in August '24.



METAVERSE ODYSSEY (SDG)

Taking Virtual Reality to a new level by integrating Sustainable Development Goals (SDGs).

WoxsenVerse SDG Odyssey creates a immersive experiences to raise awareness and drive action for global sustainability, fostering collaboration and leveraging technology for a better future.



WoxsenVerse SDG Odyssey creates engaging and interactive experiences in VR. This allows users to explore the 17 SDGs in a way that is more impactful than traditional methods. Imagine stepping into a virtual environment that depicts challenges like poverty or climate change. This firsthand experience can significantly raise awareness of these complex issues.

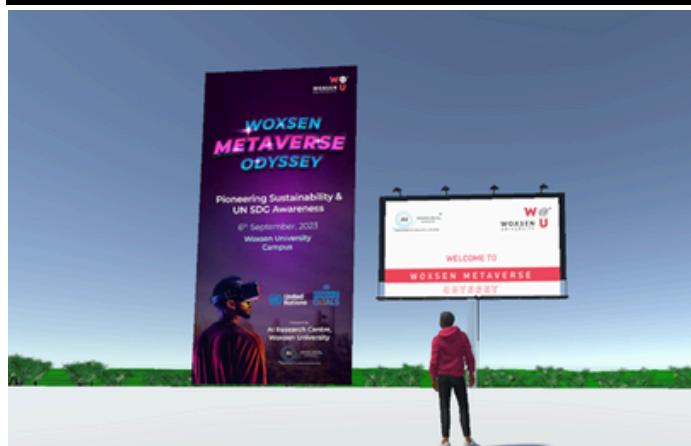




WoxsenVerse Odyssey makes awareness innovative with an interactive virtual world which showcases a cityscape with placards bearing the United Nations SDGs.

Top News

Woxsen University's Dr. Raul Villamarin Rodriguez Unveils Groundbreaking 'Necrobotica' Technology at World AI Festival in Cannes



INTERACTIVE LEARNING

The SDG banners are more than just static information displays. They are an engaging way to promote awareness. The user can interact with these boards to educate, inspire and empower active participation in sustainability initiatives to create a more sustainable future.

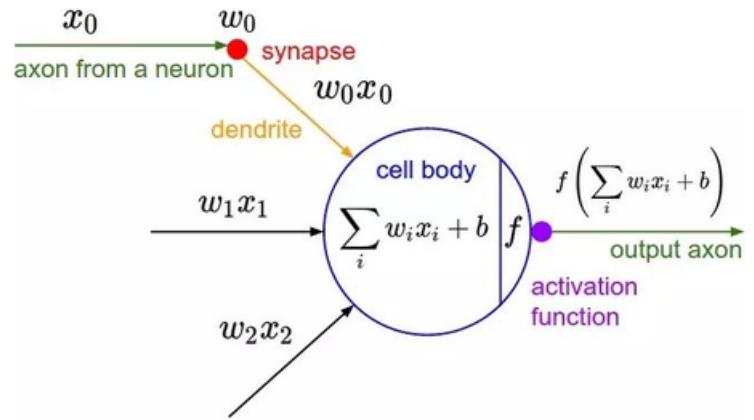
REAL-WORLD IMPACT

In an attempt to raise awareness, WoxsenVerse Odyssey was first launched amongst a network of school students to drive learning by enabling education and innovation. This was done with the intention to encourage participants to contribute to achieving the SDGs for a better future.

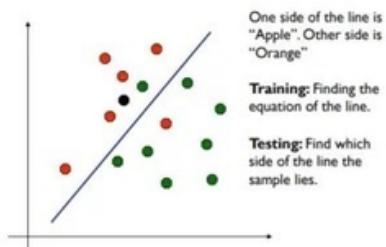
ARTIFICIAL NEURON

The AI Research Centre - Woxsen University have attempted to understand neuronal dynamics by developing an artificial model of a neuron using semi-conductor devices on printed circuit board. This model captures the spiking pattern of a biological neuron along with the biologically meaningful and computationally efficient.

Artificial neural networks (ANNs) undergo machine learning process called deep learning to perform tasks, generally without being programmed with task-specific rules. While it is intriguing to know how ANNs learn and perform tasks without any programming logic, it would be prudent to first understand their building blocks.



In this model, input signals (e.g., x_0) travel along axons and interact with dendrites of other neurons. Each signal is multiplied by a synaptic strength (e.g., w_0) to account for the connection's influence (e.g., w_0x_0). These strengths, represented by "W" weights, are adjustable and control the signal's impact. The dendrites carry the weighted signals to the cell body, where they're summed. A bias (e.g., b) is added to this sum to adjust the result. If the sum plus bias exceeds a threshold, the neuron fires, sending a spike along its axon. The neuron's firing rate is determined by an activation function $f()$, representing spike frequency. Bias helps shift the activation function towards positive (excitatory) or negative (inhibitory) outcomes.



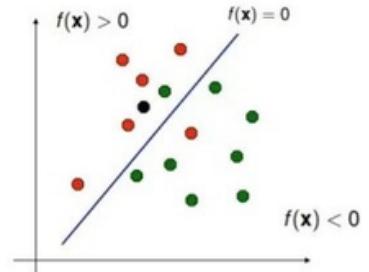
$$f(\mathbf{x}) = w_1x_1 + w_2x_2 + w_3x_3 + \dots + w_dx_d$$

$$\text{Feature Vector } \mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_d \end{bmatrix}$$

Parameters to be learned

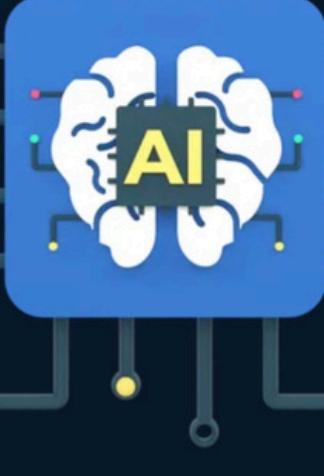
$$\mathbf{w} = \begin{bmatrix} w_1 \\ w_2 \\ \vdots \\ w_d \end{bmatrix}$$

$$\text{Compactly: } f(\mathbf{x}) = \mathbf{w}^T \mathbf{x} \text{ or } \mathbf{w} \cdot \mathbf{x}$$



- Synaptic strength is represented by the **weight** at the synapse. It's multiplied with input signals to determine their influence.
- Weights are adjustable and affect the strength of one neuron's impact on another.
- **Bias** adjusts the output and helps shift the activation function towards desired outcomes.
- **Activation** function determines spike frequency along the axon, with common ones including Sigmoid, Tanh, and Rectified.
- **Loss** function evaluates the neuron model's performance, especially in tasks like binary classification.
- Linear binary classification is depicted diagrammatically above.





ARTIFICIAL INTELLIGENCE AND KNOWLEDGE PROCESSING

(AIKP'24)

NEWSLETTER HIGHLIGHT

AI and knowledge processing conference addresses the drawbacks and challenges in current practices in various sectors. The research area includes Artificial Intelligence, Deep Learning, Machine Learning, Decision Support Systems, Knowledge representation, semantics, Bigdata analytics, Intelligent systems, fuzzy-based neural networks and other fields.

■ KEYNOTE SPEAKERS FOR THE 4TH INTERNATIONAL AIKP CONFERENCE

Dr. Kok-Leong Ong, Head of Department System & Business Analytics, RMIT University, Australia. He is the Professor of Business Analytics in the College of Business & Law, RMIT University. He is currently working on a range of analytics projects making data actionable through analytics-2-business translation, automation, and applications.



Dr. Manjeet Rege, Professor and Chair of the Department of Software Engineering and Data Sciences; Director of the Centre for Applied Artificial Intelligence. His work has been published in various peer-reviewed reputed publications, he serves on the editorial review board of journals and regularly participates on the program committees of various international conferences.



Dr. Randall Carolissen, Dean of Johannesburg Business School (JBS), Distinguished Professor of Woxsen University. He is a former group executive at the South Africa Revenue Services (SARS) and administrator of the National Student Financial Aid Scheme (NSFAS).



Vincenzo Piuri, Universita' degli Studi di Milano Dipartimento di Informatica Via Celoria 18, 20133 Milano, Italy. Vincenzo Piuri is Professor at the University of Milan, Italy .He is Fellow of the IEEE, Distinguished Scientist of ACM, and Senior Member of INNS. He is also Editor-in-Chief of the IEEE Systems Journal and Associate Editor of the IEEE Transactions on Computers, the IEEE Transactions on Cloud Computing, and IEEE Access.



Dr.Sivarama Krishnan Rajaraman, He is a Ph.D. research scientist at the National Library of Medicine (NLM), National Institutes of Health (NIH), USA. Dr. Rajaraman received the NLM Special Acts/Services Group Award in 2018. He is placed in the top 1% of reviewers consecutively on Publons' global reviewer database for the award years 2017-18 and 2018-19. This award is determined by the number of peer review reports performed during the given award year.



Prof. Abejide Ade-Ibijola, He is currently a professor of Artificial Intelligence and Applications at the Johannesburg Business School , University of Johannesburg, South Africa. He is rated by the National Research Foundation (NRF) of South Africa, and he has published 80+ articles in recognized outlets on algorithms, AI tools, and innovations for solving real-world problems in the 4th Industrial Revolution.



The logo for the 4th International Conference on Artificial Intelligence and Knowledge Processing (AIKP'24). It features a dark blue background with various logos at the top: Woxsen University, AI Research Centre, AIKP24, University of St. Thomas, JBS, and others. Below these, the text "4TH INTERNATIONAL CONFERENCE ON" is followed by the main title "ARTIFICIAL INTELLIGENCE AND KNOWLEDGE PROCESSING (AIKP'24)" in large, bold, white letters. To the right of the title is a graphic of a brain with an "AI" chip in the center, connected to a circuit board. The date "August 22 - 24, 2024" is listed below the title. At the bottom, it says "Organized By AI Research Centre, Woxsen University, Hyderabad, India" and "In collaboration with University of St. Thomas, MN USA and University of Johannesburg School of Business, South Africa."

Top News

The AIKP Conference 2024 is going to be held on WOXSENVERSE

[Link for AIKP'24](#)



Strategic Alliances: Unleashing the Potential of Executive Mentors in Educational Institutions



Dr. Hemachandran Kannan

Director of the AI Research Centre and Area Chair of the Analytics Department Woxsen University



Dr. Raul Rodriguez

*Vice President
Woxsen University*



RESEARCH PUBLICATIONS AND PATENTS

Exploring Ethical Dimensions of Environmental Sustainability and Use of AI by Raul Villamarin Rodriguez, Hemachandran K, Zita Zoltay, Paprika and Abejide Ade-Ibijola was published by IGI Global, and has been indexed in Scopus.

The patent titled **A SYSTEM AND METHOD FOR REAL-TIME THREE-DIMENSIONAL PROJECTION OF LIVE MATCHES ACROSS MULTIPLE GROUNDS Identification** has been officially published.

Dr. Raul villamarin Rodriguez, Vice President and **Dr. K Hemachandran**, Director AI Research centre 's article **Strategic Alliances: Unleashing the Potential of Executive Mentors in Educational Institutions** was featured in the prestigious **Global Leaders Today Magazine**.

Exploring Ethical Dimensions of Environmental Sustainability and Use of AI

Hemachandran Kannan, Raul Villamarin Rodriguez, Zita Zoltay Paprika, and Abejide Ade-Ibijola



IGI Global

ESTEEMED MEMBERS



■ DR. RAUL VILLAMARIN RODRIGUEZ

**Vice President at Woxsen University |
Cognitive Technologist | New Age Higher
Education | Cognitive & Behavioural
Psychology**



■ DR. HEMACHANDRAN K

**Director - AI Research Centre| Associate
Dean | Zita Zoltay Paprika - Chair Professor
|Course5i Chair Professor| Professor &
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Woxsen University| ATL Mentor of Change**

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Associate Professor ,Woxsen University

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DR. ANINDITA MAJUMDAR

Associate Professor in Psychology

