Dr. SNS RAJALAKSHMI COLLEGE OF ARTS & SCIENCE (Autonomous)
Coimbatore -641049

Accredited by NAAC(Cycle–III) with 'A+' Grade (Recognized by UGC, Approved by AICTE, New Delhi and Affiliated to Bharathiar University, Coimbatore)

DEPARTMENT OF COMPUTER SCIENCE

(ARTIFICIAL INTELLIGENCE & DATA SCIENCE)

DEEP LEARNING and AI

Ms. S. JANANI MCA., M.Phil., (Ph.D).,
Assistant Professor,
Department of Computer Science (AI&DS)

Brain-Inspired Artificial Intelligence: Integrating Cognition, Development, and Ethics

Exploring Neural Foundations, Infant Cognitive Milestones, AI Challenges, Design Thinking, Real-World Applications, and Future Considerations

The Brain: Foundation of Human Intelligence

Integration of Cognition and Behavior

The human brain integrates perception, memory, and emotion to shape cognition and behavior.

Neural Networks in the Brain

Neural networks enable complex processing by connecting billions of neurons.

Brain Plasticity

Brain plasticity allows adaptive changes in response to experiences, supporting learning and recovery.

Sensory Information Processing

Sensory information from sight, sound, touch, taste, and smell is processed to form perceptions and guide decisions.

Inspiration for Artificial Intelligence

The combined processes of perception, memory, and emotion create conscious experiences and problem-solving abilities that inspire AI development.

Infant Brain Development: Early Cognitive Milestones

Face Recognition Develops Early

Infants develop the ability to recognize faces within the first few months of life.

This milestone aids in the formation of social bonds and serves as a basis for communication skills.

Understanding Object Permanence

Around 6-8 months, infants start grasping the concept of object permanence.

They understand that objects continue to exist even when out of sight, marking an important cognitive development.

Language Acquisition Milestones

Infants progress from simple babbling to speaking first words and forming basic sentences by age 2.

This development underlines the foundational stages of communication skills.

Early Problem-Solving Abilities

Infants engage in exploring their environment and learning through cause-and-effect interactions.

This early ability to solve problems reveals the brain's efficiency in adapting and learning from experiences.

Infant Brain Development: Early Cognitive Milestones

Face Recognition Develops Early

Infants develop the ability to recognize faces within the first few months of life.

This milestone aids in the formation of social bonds and serves as a basis for communication skills.

Understanding Object Permanence

Around 6-8 months, infants start grasping the concept of object permanence.

They understand that objects continue to exist even when out of sight, marking an important cognitive development.

Language Acquisition Milestones

Infants progress from simple babbling to speaking first words and forming basic sentences by age 2.

This development underlines the foundational stages of communication skills.

Early Problem-Solving Abilities

Infants engage in exploring their environment and learning through cause-and-effect interactions.

This early ability to solve problems reveals the brain's efficiency in adapting and learning from experiences.

Real-Time Examples of Brain-Inspired AI

Healthcare Innovations

Early disease diagnosis enhanced with rapid analysis of medical images and patient data.

Brain-inspired AI aids in understanding complex medical patterns, improving diagnostic precision.

Advancements in Autonomous Vehicles

AI systems enable navigation in dynamic environments, simulating human decision-making on roads.

Autonomous driving technologies are refined using cognitive models for enhanced safety.

Enhanced Personal Assistants

Natural language processing drives AI to comprehend, respond to, and iterate conversations efficiently.

Personal assistant technology is improved by mimicking human cognitive interaction models.

THANKYOU