A Report on One Day Guest Lecture on
"Solving Real-World Problems with Multi-Agent Systems: A Soft Computing Framework"
Organised by Department of Computer Science & Technology
On 31.01.2024 (Wednesday)

Organized by: Dr. R. Manikandan, Associate Professor, Department of CST; Mr. M. Shankar, Assistant Professor, Department of CST

Submitted by: Mr. M. Shankar, Assistant Professor, Department of CST.
Resource Person: Dr. T. Kalaipriyan, Assistant Professor, Centre for Smart Grid Technologies School of CSE, Vellore Institute of Technology, Chennai.
Participants: II Year CST Department Students.
Attendance: 71 participants
Mode: Offline
Report Received on 12.02.2024

Department of Computer Science and Technology has organized a one-day Guest Lecture on **"Solving Real-World Problems with Multi-Agent Systems: A Soft Computing Framework"** on **31.01.2024** (Wednesday) from 02:00 PM to 05:00 PM.

Objective:
Over the past century there have been many profound technological, economic and social transformations. In OECD countries the full development and diffusion of innovations such as electricity, telephones and automobiles have accompanied the emergence of mass production, mass consumption and mass government. The aim of this guest lecture was to know the A multi-agent system (MAS or "self-organized system") is a computerized system composed of multiple interacting intelligent agents. Multi-agent systems can solve problems that are difficult or impossible for an individual agent or a monolithic system to solve. Intelligence may include methodic, functional, procedural approaches, algorithmic search or reinforcement learning.

Welcome address:
The Programme Started at 02:00 PM with a welcome address to all the audience by the **Mr. M. Shankar**, **Assistant Professor,**

Department of CST, MITS, Madanapalle.

The resource person started the session by extending her hearty thanks to the participants, organizing members, HOD, Principal and Management of MITS Madanapalle for giving opportunity to share her knowledge and experience in **"Solving Real-World Problems with Multi-Agent Systems: A Soft Computing Framework".**

The resource person delivered lecture on the following topics:

1. Multi-Agent environments.

2. Agent-Based Soft Computing.

3. Agent software.

4. Role of multi-agent systems in IoT.

5. Multi-agent optimization.

6. Key Characteristics of Multi-Agent Systems.

7. Examples of Multi-Agent Systems in Action.

Multi-Agent environments:

Multi-agent systems (MAS) are a core area of research of contemporary artificial intelligence. A multi-agent system consists of multiple decision-making agents who interact in a shared environment to achieve common or conflicting goals.

Agent-Based Soft Computing:

Agent-Based Computing is a diverse research domain concerned with the building of intelligent software based on the concept of "agents". In this paper, we use Sciento metric analysis to analyze all sub-domains of agent-based computing.

Agent software:

An agent is a software component of a system that collects data from the user in order to operate the system at a later time, on behalf of the user.

Role of multi-agent systems in IoT:
In multi-agent systems, each agent can include software and even robots and humans. In addition, in the IoT agents can consist of a variety of agents. Multi-agent systems architecture for IoT helps to enhance smart systems and make them more accurate and flexible.

Multi-agent optimization:

Multi-agent optimization focuses on casting multi- agent system problems into optimization problems whose solving could possibly involve the active participation of the agents in a multi-agent system. Research on multi-agent optimization has rapidly become a very technical, specialized field.

Key Characteristics of Multi-Agent Systems:

An MAS provides solutions in situations where expertise is spatially and temporally distributed. An MAS enhances overall system performance, specifically along the dimensions of computational efficiency, reliability, extensibility, robustness, maintainability, responsiveness, flexibility, and reuse

Examples of Multi-Agent Systems in Action:

- Service robots
- Transportation systems
- Exploration of hazardous environments
- Homeland security and rescue in disaster

Event Outcomes: Students can able to

- Understand the in-code common algorithm.
- Interpret the use cases for solve classical control problems.
- Relate the current advanced techniques and applications.
- Recall the recent IoT Developments.

Vote of Thanks: The session was concluded at 05:00 PM followed by a vote of thanks, given by **Dr. R. Manikandan**, **Associate Professor**, Department of Computer Science and Technology.