

## **IEEE CIS Distinguished Lecture Program**

**by Prof. Sanaz Mostaghim, FIEEE, Otto-von-Guericke-Universitat Magdeburg,  
Germany**

---

<b>Date of Event:</b>	06 November 2020
<b>Time:</b>	13:30 IST to 15:30 IST
<b>Mode:</b>	Online (Google Meet)
<b>Hosted by:</b>	Department of Information Technology, RCC Institute of Information Technology, Kolkata, India
<b>Local Coordinator:</b>	Dr. Indrajit Pan, Associate Professor and Head, Department of IT, RCCIIT, Kolkata
<b>Supervision:</b>	Prof. (Dr.) Paramartha Dutta, Chair, IEEE CIS Kolkata Chapter
<b>Attendance:</b>	60
<b>Title of the Lecture:</b>	Recent Advances in Swarm Intelligence and Robotics

### **Abstract**

In the past decades, we witnessed a large improvement of autonomous systems. Today, such systems are everywhere and enable us to handle complex problems in industrial and scientific applications. However, they also pose new challenges for the development of algorithms to design and control them. One challenge concerns the large amount of such systems which are able to communicate with each other and hence produce a large complex system. Looking at nature, biological systems solve complex tasks using decentralized and simple structures. In this talk, we aim to give an overview into such nature-inspired algorithms such as swarm intelligence and describe their applications in autonomous systems. Swarm intelligence is a collective learning process which can lead to a self-organized system of simple individuals, which together create a global emergent behaviour. Such systems can adapt very well to changes in the environment and produce flexible and at the same time robust behaviour. One advanced application of swarm intelligence is in the area of swarm robotics in which simple small robots can collectively learn to achieve some predefined complex tasks. In this talk, the algorithms of swarm intelligence are presented, analyzed and compared. The following topics will be covered:

- a) Fundamentals of swarm intelligence algorithms and optimization
- b) Collective learning and decision-making
- c) Collective perception algorithms
- d) Control mechanisms for self-organized systems using the environment (isomorphic and non-isomorphic transformations)
- e) Swarm and evolutionary robotics

## Brief Profile of Prof. Sanaz Mostaghim

Sanaz Mostaghim is a full professor of computer science at the chair of Computational Intelligence and the founder and head of SwarmLab at the Faculty of Computer Science, Otto von Guericke University Magdeburg, Germany. She holds a PhD degree (2004) in electrical engineering from the University of Paderborn, Germany. Sanaz has worked as a postdoctoral fellow at ETH Zurich in Switzerland and as a lecturer at Karlsruhe Institute of Technology (KIT), Germany, where she received her habilitation degree in applied computer science. Her research interests are in the area of multi-criteria decision-making, collective learning and decision-making, and their applications in robotics and science. Sanaz is the deputy chair of the Informatics Germany and a member of the advisory board on Digitalization at the ministry of Economy, Science and Digitalization, State Saxony-Anhalt, Germany. She is an active member of IEEE Computational Intelligence Society (CIS) and serves as a member of the CIS Administration Committee. She is associate editor of IEEE Transactions on AI, IEEE Transaction on Evolutionary Computation and member of the editorial board of several international journals on Robotics and AI. Since 2020, she is appointed as a distinguished lecturer at IEEE CIS.

## Glimpses of Events

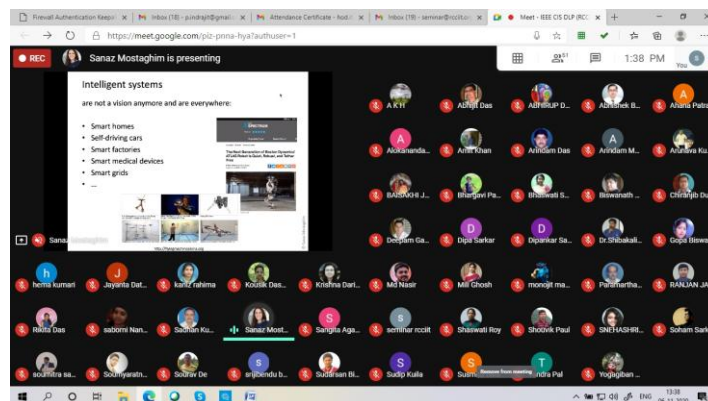


Fig. 1: Glimpse of Participants during DLP

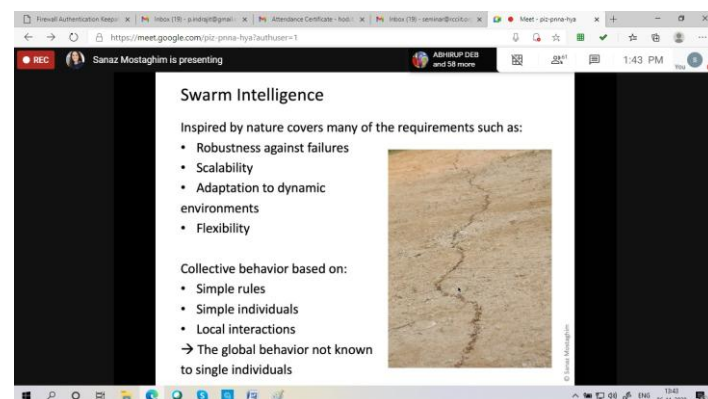


Fig. 2: Presentation

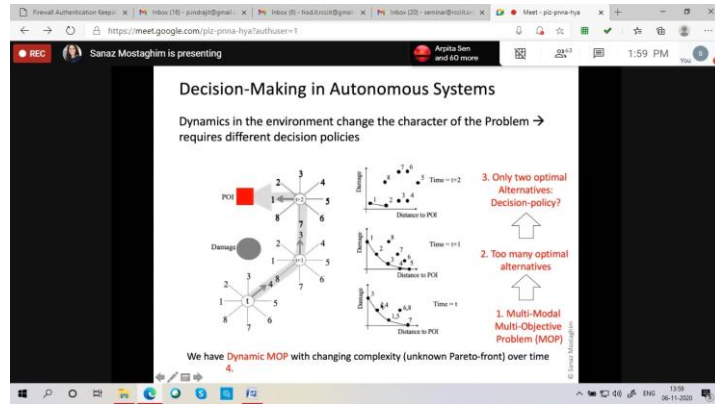


Fig. 3: Presentation

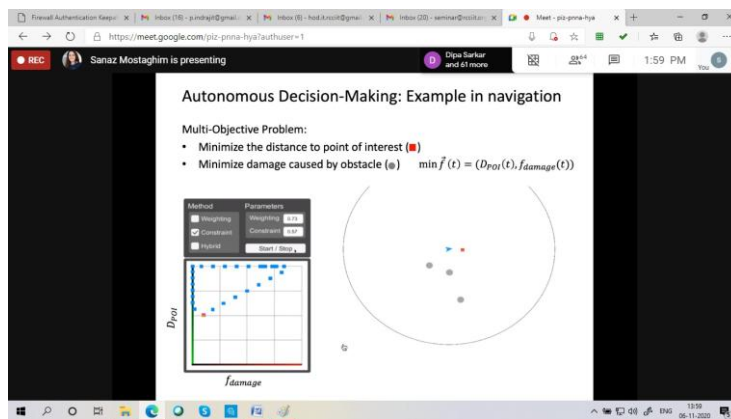


Fig. 4: Presentation



Fig. 5: Prof. Sanaz Mostaghim, FIEEE during Q and A

List of Participants

Sl. No.	Full Name	Institute/ Organization Name	IEEE Membership ID
1	KOYEL CHAKRABORTY	Supreme Knowledge Foundation Group of Institutions	
2	Saborni Nandi	RCC Institute of Information Technology	
3	Dr. Debabrata Samanta	CHRIST (Deemed to be University)	91170948

4	Abhishek Basu	RCC Institute of Information Technology	90315295
5	Arijit Ghosh	RCC Institute of Information Technology	
6	DIPANKAR SANTRA	RCC Institute of Information Technology	
7	SRIJAN BHATTACHARYA	RCC Institute of Information Technology	93789546
8	Dr. Soham Sarkar	RCC Institute of Information Technology	
9	Dr. Sourav De	Cooch Behar Government Engineering College	90326534
10	Arindam Mondal	RCC Institute of Information Technology	
11	SIDDHARTHA CHATTERJEE	Gargi Memorial Institute of Technology Kolkata	
12	Monika Singh	RCC Institute of Information Technology	
13	Amit Khan	RCC Institute of Information Technology	
14	Deepam Gangopadhyay	RCC Institute of Information Technology	
15	SUDARSAN BISWAS	RCC Institute of Information Technology	
16	Shaswati Roy	RCC Institute of Information Technology	
17	Arpita Banerjee Roy	RCC Institute of Information Technology	
18	Krishna Daripa	Sarsuna College	
19	Chandra Patro	Techno Main Salt Lake	
20	ARINDAM DAS	MCKV INSTITUTE OF ENGINEERING	94320731
21	ABHIRUP DEB	Cooch Behar Government Engineering College	
22	Dr. Shibakali Gupta	UIT, Burdwan University	
23	MONOJIT MANNA	JADAVPUR UNIVERSITY	
24	SRIJIBENDU BAGCHI	RCC Institute of Information Technology	85021583
25	Mr Chiranjib Dutta	Guru Nanak Institute of Technology	
26	Dr. TIYA DEY MALAKAR	RCC Institute of Information Technology	
27	Arunava Kumar Chakraborty	RCC Institute of Information Technology	
28	NEHA ROY	RCC Institute of Information Technology	
29	JAYANTA DATTA	RCC Institute of Information Technology	
30	RANJAN JANA	RCC Institute of Information Technology	
31	Ahana Patra	RCC Institute of Information Technology	
32	SOUMYARATNA DEBNATH	Coochbehar Government Engineering College, Coochbehar, West Bengal	
33	Yogagiban Chakrabarti	RCC Institute of Information Technology	
34	MADHABI GHOSH	RCC Institute of Information Technology	
35	Tapan Chowdhury	Techno Main Salt Lake	
36	Arpita Sen	RCC Institute of Information Technology	
37	Shouvik Paul	Cooch Behar Government Engineering College	
38	Md Nasir	Visva-Bharati University	
39	BAISAKHI JANA	RCC Institute of Information Technology	
40	Kaniz Rahima	RCC Institute of Information Technology	
41	PRIYA SEN PURKAIT	RCC Institute of Information Technology	
42	BHASWATI SADHUKHAN	RCC Institute of Information Technology	
43	Mili Ghosh	Visva Bharati University	
44	Arnab Sadhu	Vidyasagar University	
45	SHARMISTHA BANERJEE	RCC Institute of Information Technology	
46	Susmita Bala	Vidyasagar University	
47	Soumitra Sasmal	Techno Main Salt Lake	

48	SNEHASHRITA NATH	COOCH BEHAR GOVERNMENT ENGINEERING COLLEGE	
49	Biswanath Chakraborty	RCC Institute of Information Technology	
50	Dr. Sangita Agarwal	RCC Institute of Information Technology	
51	A. Sufian	Gour Banga University	
52	Abhijit Das	RCC Institute of Information Technology	
53	Alokananda Dey	RCC Institute of Information Technology	
54	Biprodeep Roy	RCC Institute of Information Technology	
55	Devvrat Kumar	RCC Institute of Information Technology	
56	Dipa Sarkar	RCC Institute of Information Technology	
57	Gopa Biswas	RCC Institute of Information Technology	
58	Kousik Dasgupta	Kalyani Government Engineering College	
59	Pranab Mondal	RCC Institute of Information Technology	
60	Sadhan Kumar Dey	RCC Institute of Information Technology	