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Workshop on Socially Aware and Cooperative Intelligent Systems

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Workshop on Socially Aware and Cooperative Intelligent Systems

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Abstract

This workshop theme centers on the development of AI agents and systems that are capable of understanding, adapting to, and reacting to collaborate with humans in compliance with the social norms. These systems leverage insights from social psychology, cognitive science, robotics, and AI to interpret social cues, anticipate the needs of others, and coordinate actions effectively within dynamic and often unpredictable contexts. We focus on embedding social awareness into AI systems, leading to Cooperative Intelligence [23] which focuses on building trust and relationship between humans and intelligent systems, instead of focusing on functions to replace humans. This paradigm is expected to realize a hybrid society, where humans coexist with ubiquitous intelligent agents.

CCS Concepts

• **Human-centered computing** → **Collaborative interaction**; **HCI theory, concepts and models**; **Interaction design theory, concepts and paradigms**; **Collaborative and social computing theory, concepts and paradigms**; • **Computing methodologies** → **Philosophical/theoretical foundations of artificial intelligence**.

Keywords

Socially aware AI, cooperative intelligence, group interaction, social norm, nonverbal cues

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1 Introduction

As intelligent systems such as robots and virtual agents become increasingly integrated into homes, workplaces, and transportation systems, a key challenge is ensuring that they collaborate and interact with humans in a seamless and natural manner, while adhering to social norms. Addressing this challenge requires cooperative intelligence [23], which draws on interdisciplinary advances in robotics, AI, human–robot and human–computer interaction, computer vision, and cognitive science.

1.1 Relation to Previous Workshops

To benchmark this proposal, we reviewed recent workshops at major conferences. Some workshops, such as [11] and [1], apply AI to human–robot interaction models, covering areas like motion planning, social task learning, navigation, and behavior recognition, with a strong emphasis on enabling autonomous systems. Others, such as [21], focus specifically on human behavior prediction. Workshops including [27] and [24] emphasize social robots and explore elements of cognitive collaboration in controlled laboratory settings. A different line of work, represented by [26] and [30], highlights the role of nonverbal cues in enhancing human interaction with agents and robots. In computer vision–oriented venues, [28], [15], and [2] investigate human behavior sensing through face, head, and posture analysis, while [12] addresses affective state recognition from facial features under controlled conditions.

1.2 Goals and Objectives

Unlike previous efforts that emphasize automation, our workshop centers on developing socially aware systems in real-world settings by leveraging cooperative intelligence and keeping humans in the loop. The discussions will focus on computational methods for sensing and recognizing nonverbal cues and internal states in the wild, as well as on advancing cooperative intelligence between humans and intelligent systems. Additional topics include learning and behavior generation that adhere to social norms, along with supporting resources such as social interaction datasets.

2 Workshop Structure

Workshop's URL: https://social-intel-workshop.github.io/2025/

2.1 Workshop Content and Scope

A key consideration in achieving cooperative intelligence between humans and intelligent systems is enabling mutual understanding, similar to how humans infer and trust each other's implicit

internal states such as intentions, emotions, and cognitive states. The importance of empathy in facilitating human–robot interaction has been highlighted in previous studies [17, 22]. However, it remains challenging for intelligent systems to estimate human internal states, as these are highly dependent on complex social dynamics and environmental contexts. Addressing this challenge requires systems capable of sensing multimodal inputs, reasoning over abstract knowledge, and generating appropriate responses for collaboration and interaction with humans. Numerous studies have explored methods for estimating internal states using wearables and non-invasive sensors [14, 32], but such approaches are difficult to deploy in the wild due to the need for humans to wear additional devices [29, 31], and they are often limited to controlled environments. Thus, it remains an open question how intelligent systems can sense and recognize nonverbal cues and reason about the rich underlying internal states of humans in noisy, real-world settings. The scope of this workshop includes, but is not limited to:

- Human internal state inference, e.g., cognitive, emotional.
- Recognition of nonverbal cues, e.g., gaze, gesture.
- Multi-modal sensing fusion for scene perception.
- Learning algorithms
- Generative and adversarial algorithms.

2.2 Workshop Program

We plan a full-day event for 8 hours, including oral and poster presentations of accepted/invited papers, talks by 4 invited speakers, 2 interactive sessions including a demonstration and a panel discussion. For participants who could not attend in person, we will disseminate the papers and pre-recorded videos on our workshop page. The full program can be found on our workshop webpage.

2.3 Invited Speakers

The speakers come from diverse background spanning cognitive science, AI, robotics, and computer vision to provide holistic views on how to achieve socially aware and cooperative intelligent systems in the wild environments. We have confirmed the attendance of 4 esteemed speakers, whose details and the tentative titles of their talks are listed on the workshop webpage.

2.4 Call for Paper Plan

All accepted/invited papers will be presented both as in-person 8 minutes flash talks, and posters for discussions during the coffee break. This arrangement will enable workshop participants to understand all the works presented during the flash talk, and approach the targeted presenter during the poster session to have in-depth interaction or Q&A. To further promote active participation and discussions, each paper will also post a short pre-recorded video (about 3 minutes) on the workshop page.

2.5 Interactive Session

We plan 2 interactive sessions which include (1) an open demonstration of human-robot interaction, where participants interact with an AI agent in a multiparty scene to experience the current socially aware and cooperative AI agents, and (2) a panel discussion between the invited speakers, co-organizers, and the audiences, with the theme *"Leveraging Generative AI to Realize Group to Societal Interaction for a Harmonious Hybrid Society"*. The invited speakers will be the forum panelists.

2.6 Plan to Solicit Participation

This workshop will accept submissions of unpublished works. We expect about 12 high-quality papers related to the topics covered by this workshop and invite about 2 HAI2025 papers. The accepted papers can be new submissions or papers rejected at HAI2025. We will promote the workshop on WikiCFP and social media. If our proposal is accepted, we will elicit sponsor from companies for the Best Paper Award. Each submission will receive two single-blind reviews by reviewers with expertise relevant to submitted papers.

3 Expected Outcomes

This workshop is expected to bridge the gap in between implementation of cooperative intelligence in the lab and wild/noisy environments, leveraging on the diverse backgrounds and work experiences of members from academia and industry. Such diversity is also expected to lead to new insights and solutions.

3.1 Estimated Attendance

The target audiences are researchers who work on human-robot interaction, robotics and human behavior sensing and recognition. We expect about 80-100 attendees.

3.2 Dissemination

The workshop organizing team will disseminate all the related presentation slides/videos by curating and making them public on our workshop website. Some workshops successfully organized and curated by team members include the NOC Workshop series https://nocworkshop.github.io/2025/ and Privacy-Aware Robotics https://sites.google.com/view/privacyawarehri24/home. We will propose special issues for journals as an extension of the works presented at this workshop.

4 Organizers

The organizing team has rich experience in organizing workshops and international conferences like ICRA, IROS, HRI, RO-MAN.

• **Jouh Yeong Chew (Honda Research Institute Japan)** is a senior scientist working on nonverbal cues analysis [6–8, 10, 20, 25] and development of systems with cooperative intelligence. [5, 9]. He has organized workshops at IROS and ICRA [26, 30], and is a Senior/Guest Editor for Advanced Robotics.

• **Alan Sarkisian (Honda Research Institute Japan)** is a senior engineer working on system architecture for distributed networks of social robots. His research is focused on trust, transparency, and privacy-preserving technologies for social robotics [19]. He has successfully organized a workshop at HRI. [18]

• **Christiane Wiebel-Herboth (Honda Research Institute Europe)** is a senior scientist working on on how to quantify and design successful human-machine cooperation from a user-centric perspective. [4, 16], and she has organized a workshop at ECVP.

• **Christiane Attig (Honda Research Institute Europe)** is a guest scientist working on meaningful human-AI interaction [4]. Her research is focused on Self-Determination Theory as a framework for understanding and designing interaction with technology [3] as well as aspects of user diversity [13].

• **Zhaobo Zheng (Honda Research Institute USA)** is a senior scientist working on multimodal machine learning, in HCI and automated agents. He published over 40 papers in interdisciplinary fields such as signal processing, and HRI. He was in the organizing

committee of RO-MAN2024.

• **Shigeaki Nishina (Honda Research Institute Japan)** is a Principal Scientist working on cognitive psychology, neuroscience, and computational theory. His research focuses on modeling HMI from these perspectives and implementing effective interactive systems. He is interested in developing principled approaches to human-centered interaction design and intelligent system behaviors.

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