Expressive/Sensitive

Full day workshop at DIS 2020

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Expressive\Sensitive

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Abstract

Our interactions form an intricate 'dance' – a dance requiring a fluent integration of both expressivity (e.g. to approach someone) and sensitivity (e.g. detect if you '*should*' approach someone). Work on behaving artefacts has focused mostly on the social, emotional and aesthetic qualities that can be evoked – **expressed** – through interactions involving such artefacts.

Meanwhile, novel methods from social signal processing and affective computing are beginning to imbue artefacts with a reflective awareness – a **sensitivity** – to the emergent social aspects of the interaction.

Can we empower the expressivity of behaving artefacts by integrating it with such sensitivity? With this workshop we aim to bring together a range of perspectives, on the performative and technological opportunities for such artefacts, as well as on their potential (adverse) social and societal implications; to jointly establish what will be necessary to achieve Expressive\Sensitive artefacts that positively enrich and participate in the 'dance' of social interaction.

Author Keywords

Expressive Artefacts; Social Interaction; Social Signal Processing; Affective Computing

CCS Concepts
•**Human-centered computing** → **Interaction design;** •**Computing methodologies** → *Artificial intelligence;* •**Applied computing** → *Performing arts; Law, social and behavioral sciences;* •**Computer systems organization** → *Embedded and cyber-physical systems;*

Introduction
Have you ever witnessed how a whispered word can, in some interactions, be infinitely more stern than an angry shout would be? Have you ever witnessed how, in other situations, the exact opposite can be true? Social behaviours are, inherently, embedded in interactions. To effectively navigate this embedding and the emergent properties that result from it, requires a complex 'dance' that fluently integrates both expressivity (e.g. whisper or shout) and sensitivity (e.g. detect if you should shout).

A large body of work on 'behaving artefacts', among others in the field of Interaction Design (see, e.g. [10]), has focused on the social and emotional qualities that can be evoked through interactions with those artefacts, i.e. **expressiveness**; from scared lamps [7], to small robots that stimulate collaboration within groups [14].

At the same time, the (young) field of Social Signal Processing [12, 9] is rapidly approaching the point where artefacts can be imbued with some capacity to reflect on the social situation they are embedded in; an artificial **sensitivity** to the emergent social aspects of the interaction (e.g. in the context of social navigation [13]).

Together, this work and these technologies, have the potential to enable the new and powerful integration of Expressive\Sensitive capacities within the artefacts we create. But how can we devise suitable ways of integrating expressivity with such novel social sensitivity?

Envision a version of Clippy, the well-known virtual office assistant, that would accurately detect when you actually *do* need help, and offer it then and only then.

On the one hand, this is a question about possibilities – what kind of integrations can we achieve? How can we take the current possibilities and limitations of current expressive and sensitive capacities into account in such integrations? How can we implement the intricacies of the 'dance' of social interaction?

On the other hand, it should also be a question of impact and implications. How will such integrations affect the relationships we form and can form with and through such artefacts; will it change their perceived presence and agency, affect our expectations, or simply be uncanny or unethical? What risks could such changes bring?

These perspectives on integrating expressive\sensitive are strongly co-dependent. Work on the possibilities should, ideally, be informed by their potential impact and implications, and vice versa.

Thus, with this workshop we intend to combine these perspectives, bringing together people from different backgrounds to collect insights into the open challenges and opportunities for integrating expressivity and sensitivity. Our main focus will be on jointly investigating the key questions from the different perspectives. Through these efforts, we aim to define a research agenda and to foster a multidisciplinary community.

Related work
Expressive Artefacts
Artefacts can engage in, and facilitate, the act of expressing in a fascinating range of ways. At its most basic, this includes washing machines that beep to indicate they have finished a washing program. Beyond that, the increased expressiveness of objects can include many different sensory modalities in various ways – which enables more value-driven acts of expression, such as the 'tactful' approach to

signalling used by AscoltaMe [2]. Expressive roles can be fulfilled by various different types of actions (see sidebar).

While people tend to be quite apt at recognising such artificial acts of expression, they can feel rather one-sided – e.g. Clippy being over-eager to help, or autonomous cars stopping with such safety margins that people could just cross the street right in front of them.

(Social) Sensitivity
At the same time, the relatively young field of social signal processing [12] – or, more broadly, the field of affective computing [9] – has been imbuing artefacts with the capacity to be sensitive and even reflective on social aspects of situations. And here, too, the examples are too numerous to mention. From detecting interpersonal attraction from wearable sensors [5], to detection of subjective perception of a robot's behaviour from posture [13]

Expressive\Sensitive: Challenges and opportunities
Though we are yet to fully capitalize on the possibilities afforded by these novel (social) sensitivity technologies, there already exist various artefacts that combine expressivity with (some) sensitivity. From the early example of robotic desk lamps that try to aim their light at what their users may need lighted [3], to social media attempting to present content that is 'best' suited to individual users. Recent design explorations have investigated some boundaries for expressive\sensitive artefacts, e.g. by approaching them as different types of agents and designing their behaviour accordingly [1], or by moving the social presence of these agents across different bodies and contexts [8]. It is worth noting though, that such integration is currently more common in popular media depictions of intelligent artefacts – after all, HAL *did* say "*I'm sorry*, Dave, *I'm afraid* I can't do that" (emphasis ours) in reaction to Dave's distress [6].

Types of Expressive Acts

Some artefacts use functional actions to fulfil expressive roles in and of themselves: from a purely functional robot (Kuka arm) that has been shown to communicate complex intentional acts and shape team dynamics during shared tasks [4], to Push-one, a hybrid between a social robot and a "thing", which uses simple functional acts to communicate complex pro-social and collaborative intention in interactions with children [14].

Other artefacts deliberately attempt to emulate anthropomorphic or zoomorphic forms of expression: from backpacks that move in ways evocative of fear and interest [11], to the light-emitting Shybo that manifests something akin to 'fear' by shaking in response to loud and sudden noises [7].

And yet, all these works also beg the question: Will it be possible, desirable, and/or appropriate for artefacts to have their expressivity 'empowered' even further, with more sophisticated social sensitivity? Can and should we make such artefacts? Imagine a recommender algorithm matching the music or adverts it presents to your mood - or an artefact that keeps trying to cheer you up because it incorrectly interprets your neutral facial expressions as sadness.

Aims

With this workshop we aim to explore these core questions into what will be necessary to achieve effective Expressive\Sensitive artefacts. Can and should we actually integrate expressivity with such novel social sensitivity technology? How? What will be the positive and negative effects of doing so? Could we use this to create artefacts that participate in the 'dance' that is social interaction? Or will such attempts veer into the uncanny?

In our experience, an in-depth investigation of such questions will first require a solid common ground between a range of different perspectives – from researchers and makers with a rich diversity in backgrounds. The impact and implications cannot be properly considered without an awareness of what would be feasible. And, likewise, attempts at investigating and implementing the possibilities should be informed by an awareness of their potential impact and implications.

The core aim of this workshop will, therefore, be to jointly establish an inspiring and diverse set of questions relevant to expressive\sensitive artefacts. This set can then serve as a starting point to find suitable approaches and collaborations to investigate these questions. These outcomes will be bundled together to form a research agenda. To also foster collaborations with the broader communities, we aim

to compile the proceedings and publish them in arxiv.org, and will consider a white paper to further document the perspectives explored at the workshop.

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