EMOBOT: AN ONLINE EDUGAME TO DEVELOP RECOGNITION OF OTHER PEOPLE'S EMOTIONS

EMOBOT: UN EDUGAME ONLINE PER SVILUPPARE IL RICONOSCIMENTO DELLE EMOZIONI ALTRUI

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Abstract

Emotions underlie every affective and momentary psychic state that consists of the body's opposing reaction to perceptions or representations that upset its equilibrium. Indeed, knowing how to interpret other people's emotions is crucial on a social level. When a child does not know how to interpret these reactions becomes, from a didactic point of view, significant to conduct training to improve the "reading" of others' emotions. Besides, emotion recognition ensures a prerogative for empathy and consequently opens a possibility to act teaching-learning processes balanced to each learner. In this paper, an edugame, called Emobot, is presented, it helps children to identify a basic set of emotions: happiness, sadness, fear, astonishment, anger and disgust as well as a "neutral" face.

Le emozioni sono alla base di ogni stato psichico affettivo e momentaneo che consiste nella reazione contraria del corpo a percezioni o rappresentazioni che ne sconvolgono l'equilibrio. Infatti, saper interpretare le emozioni degli altri è fondamentale a livello sociale. Quando un bambino non sa interpretare queste reazioni diventa, dal punto di vista didattico, significativo condurre training per migliorare la “lettura” delle emozioni altrui. Inoltre, il riconoscimento delle emozioni assicura una prerogativa per l'empatia e di conseguenza apre la possibilità di mettere in atto processi di insegnamento-apprendimento equilibrati per ogni discente. In questo lavoro viene presentato un edugame, chiamato Emobot, che aiuta i bambini a identificare un insieme di emozioni base: felicità, tristezza, paura, stupore, rabbia e disgusto oltre a un volto "neutro".

Keywords

Emotions; empathy; edugames; didactics.
Emozioni; empatia; edugames; didattica.

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1. Why is it important to recognize other people's emotions?

People interact with each other and express many concepts without speaking. Such communication is called nonverbal and goes through two main phenomena: emotions and proxemics (which is not explored in this paper). Through them people carry out highly evolved (metacognitive) processes and reasoning and can carry out perspective fields and reason through evolved concepts (e.g., empathy). This research will explore a very circumscribed challenging: improving how recognizes emotions because knowing how to interpret other people's emotions is crucial on a social level, certainly, it is useful in didactic. Indeed, emotions underlie every affective and momentary psychic state that consists of the body's opposing reaction to perceptions or representations that upset its equilibrium. When a child does not know how to interpret these reactions she/he becomes important to conduct trainings to improve the "reading" of others' emotions. Thus, These premises led to the creation of an educational video game (edugame) named Emobot, designed to identify several emotions: happiness, sadness, fear, astonishment, anger and disgust as well as a "neutral face". In this work, it is assumed as well that the recognition of emotions ensures as well a greater familiarity with empathy and consequently the possibility of activating teaching-learning processes proportionate to the characteristics of people, regardless of whether they are teachers or learners: in a certain sense everyone needs empathy to activate a didactic interaction (Sibilio, 2020).

2. Definitions of empathy for Edith Stein in brief

For Edith Stein (1891-1942) German philosopher and Husserl's teaching assistant, with her doctoral dissertation "on the problem of empathy", *Zum Problem der Einfühlung*, a season opens in which empathy has new meanings it is no longer about aesthetic factors that link artworks to visitors. In brief, for Stein, empathy is the basic form in which people are given other embodied "Spiritual Subjects" through experiencing (Stein, 2012); it is not simply an epistemological tool for accessing other subjects or simply registering their existence as mental beings; rather, empathy is itself a distinctive intentional experience (Ales Bello, 2003, 2007). Empathy is not to be confused with related concepts, undoubtedly avoiding two phenomena: identification in the other and self-transposition. One of the main merits of Edith Stein's work is that it offers a multidimensional view of empathy. There is a form of empathy, which could be called basic, which shares distinctive features with ordinary perception or "direct perception" of social cognition. The scholar points out the existence of a more complex form of empathy called "empathic understanding" that is set in motion from the former (one moves from perceiving to understanding the other). Finally, Stein makes a clear distinction between the concept of empathy and other phenomena such as: compassion, imitation, mimicry, emotional contagion, affective unification, "feeling at one with," "feeling together," "feeling with," sympathy and emotional sharing (Davis, 1990); in other words, it could be said that it also defines empathy by enunciating what it is not. Regarding the second dimension just proposed, Stein conceives of the empathic encounter as a three-steps, be able to: *see* the emergence or appearance of the other's experience occurs through others behavior and bodily expression; *emphasize* unspecified experience to an explanatory fulfillment; *synthesize* objectification of the explicated experience, on which one then reflects and dwells: this gives to this three-steps process the power to grasp not only the dispositions and motivations of another (in a didactic contest), through a social context able to favorite a person's motivational "nexus", as well as the distinctiveness of a person and his or her way of being (Todino, 2023). For Stein, the understanding of the "Spiritual Subject" is determined by the recognition of its emotions, feelings and values. From Stein's perspective, Emobot fosters at least one of these aspects: recognizing the emotions of others.

3.A possible comparison between Stein and Rogers regarding the issues of empathy, congruence, actualizing tendency, and emotions

Carl Ransom Rogers, (1902, 1987) was an American psychologist who invented the client-centred method of psychotherapy to lay emphasis on an emphatic relationship between the therapist and the client; it is worth noting that Rogers also dealt with school education. Rogers tries to point out that empathy (= knowing how to put oneself in the interlocutor's "shoes") from many points of view: bodily, emotional, phantasmatic and cognitive; this is the first indispensable step in approaching psychotherapy and pedagogy specifically to be human sciences (Rogers, 1973; Ariano, 1990; Digaetano, 2010). The second step for an educator is to distinguish (and know in deep) how to stand in one's own shoes and determine how one's way of being can make grow others. This second step is the congruence Rogers talks about (Ariano, 1990). Unfortunately, Rogers' method shows gaps: the philosophy of Rogers' actualizing tendency imprisons him in an American humanistic view that prevents him from entering the deeper level of subjectivity and intersubjectivity that opens up other questions that are still difficult to answer today, such as interaction and full inclusion in didactic. Obviously, there are many Anglo-Saxons who have critical or opposite positions to these but in general, the American and British school systems are affected by this approach. Comparing this American psychologist with the first-mentioned German philosopher, we see that Stein's work about empathy, more precise than Rogers', also stops at the threshold of these issues. of a positivism that in Rogers' case is related to a philosophical and cultural movement, inspired by certain fundamental guiding ideas generally referring to the exaltation of scientific progress, in Stein's case one could speak rather of a "positivity" that stems from her being deeply religious (a spiritual "quest" that first brings her closer to a phenomenology that sees man as a spiritually endowed individual and then leads the philosopher to become a Carmelite nun). Well, this applies (scientific positivism linked to the progress of contemporary society or anthropology that sees man as the creator/maker of an actualizing spiritual journey, can rise also in special didactic, furthermore these ideas are currently (and dangerously) the most widespread, it has its origins with a good purpose in the Anglo-Saxon concept of Special Educational Needs that suffers from the philosophy of the actualizing trend imprisoned in an Anglo-Saxon humanistic vision that takes the term to educate (=educĕre 'draw out') too literally, but an educator cannot always draw something out (= if there are no socks in a drawer, it will be difficult to be able to draw them out of that drawer; wanting to amplify the matter with a popular adage). A positivism "soaked" view in special education could induce teachers to look for something to get out of the students at any cost, without hesitation on actualizing tendency, education could be derailing toward a self-referential positivism trend often moved by political desires in which it is important to point out that the watchword is inclusion, but the latter is not applied in practice because it does not curve with congruence and empathy towards the student and at the same time makes the teacher "feel good" at work. So, every educator should understand two biases: congruence Vs updating tendency (in the micro) and inclusion as a political watchword and inclusion that can effectively be implemented through the congruence and empathy of each teacher in daily activity.

4.Empathy as a special case of rational understanding

Stein and Rogers' definitions "paved the way" for serious consideration of empathy as a theoretical and practical "construct" for reasoning about education and emotional intelligence. Nowadays, there are current models that define empathy as a special case of rational understanding: explicit simulation theories and perceptual and decision-making models, such as perspective-taking proposed by Alain Berthoz (2011), professor emeritus at the Collège de France and member of the French Academy of Sciences, who directed the *Laboratoire de physiologie*

de la perception et de l'action (CNRS-Collège de France), a model that underlying a theory spatial and neurophysiological theory of empathy, specifically, perceiving is already deciding and this determines the action or inhibition of certain behaviours (Sibilio, 2013, 2020), indeed, concretely it is measurable in quantitative terms (through observation that can be carried out through digital tools and in particular with a webcam and specific software). Well, only an appropriate definition of empathy that narrows its scope can be effectively converted algorithmically by a machine, Berthoz's certainly can accomplish this purpose; instead, those of Stein or Rogers cannot be easily identified by an algorithm (currently). In general, from a software development point of view, if empathy is a rational capacity, programmers could write software that allows its initial "germination" in some directions: recognition of others' emotions, exercising perspective shifting and mental rotation (which are characteristics that Berthoz considers essential for developing empathy). These considerations "open up" the opportunity to design and develop educational video games or educational robots suitable for developing these rational properties.

5.Emotions and cultural psychology: a natural attractor for children born in digital screens era.

Empathy is essential in relationships and, in a way, comes through the identification of emotions besides empathy opens a "chink" that makes anyone understand the other's emotion. Indeed, we can also motivate what has been said from the point of view of cultural psychology, here is a possible explanation: from a social psychology perspective there is an issue when a person is not being able to recognize other people's emotions and therefore having behaviours that disregard those emotions, e.g., being excessively cheerful if the other person is sad. Foucault (1998. 2019) would have pointed out that people can say this, especially when a child who reaches adulthood without recognizing emotions would be negatively categorized socially. For this reason, it may be useful to conduct training through an instrument (in our cases an edugame) that, according to Lev Vygotsky's (1987), canon of social psychometry, should maximize the relationship between competence to learn (= learning others' emotions) and performance (= be positively categorized socially). Furthermore, in accordance with Winnicott (Davis, Wallbridge, 1984) society must place this child (who does not recognize the emotions of others) in a safe situation (a comfort zone in terms of social interaction) that can improve the performance of the teaching-learning process, thus, videogames are a natural attractor for children born in digital screens era (Tisseron, 2016). Certainly, learning in a human-computer interaction and not in a social context can be a diminutio (in the terms expressed by Winnicott); but in some serious cases, digital training is better than no training at all.

6.ASD-Robot, Emorobot and Emobot: history of an evolving project

Emorobot is an open-source educational robot, aimed to promote "the development of social skills in children with autism, (Cottini, Vivanti, Bonci, 2017) in order to assume the role of learning companion or functional toy within activity sessions that include an interaction with the automaton" (Campitiello, Todino, Di Tore, Di Tore, 2022, p.3). Although it was made for children with autism we quickly realized that it is useful for anyone.

Figure 1: on the left Emorobot tested at the Maker Faire Rome in 2022, on the right the set of emotions detectable by the robot.

At the technological level, this robot is based on a software called Mind-Reading that "imitating the expression that is represented in the various photographs. In this way, in the child with autism we try to create a greater bodily involvement, through the imitation of different emotions, which should help to memorize the emotions" (Ivi, p. 5) according to the Basic emotions. Handbook of cognition and emotion a very famous worldwide research of the American psychologist Paul Ekman (1999).

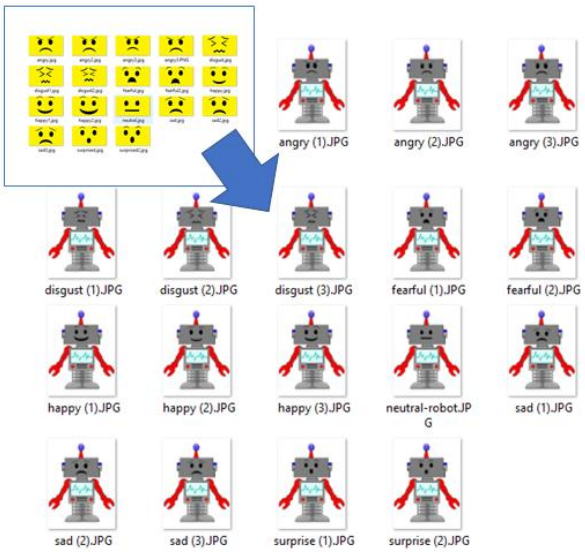

Figure 2: the set of emotions reported in the edugame Emobot

7.The gameplay: How does the edugame work?

Starting from the software in the robot, which recognizes emotions and displays them in Lattepanda's display, a new software design was planned that follows the following pattern: after a brief introductory story the user is proposed to teach emotions to an expressionless robot. The scheme of operation is simple: if the intente for a certain interval of time maintains the expression of the seen with a certain emotion the software identifies it and the gamer is made to assume that it has passed a level of the game. When all levels are passed (i.e., the videogame player can show emotion) the game ends by winning it.

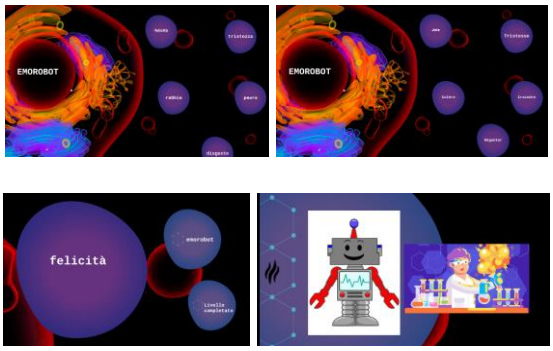

Figure 3: Some pictures of the design of Emobot (developed in two versions: Italian and French).

8. Conclusions

The game is now in the design phase, it is derived from the Emorobot project and therefore the potential related to facial recognition of a user's emotions through the camera is already known. What changes the most between Emorobot and Emobot is the presence of structured gameplay and a story that is somewhat reminiscent of the video games of the 1980s and 1990s that have had their own revival in the last decade in video games for Android and iOS platforms. The latter constatation makes it possible to ensure a certain familiarity for video gamers of a young age. Future steps of the project consist of: 1) completion at all levels of the game; 2) debugging; and 3) experimentation on a relevant number of children and adolescents. In conclusion, the game is proposed as a quantitative digital tool that can definitely have "spillover" effects in terms of quality. In a sense, in this paper first proceeded to show "high-level"/qualitative theoretical models of empathy (with related emotion considerations), and then projected to something measurable through a tool/game suitable for making emotion learning real that opens a "window" to those (= student/child) who (= student/child) are not yet clear on how it is viewed from a heterocentric, thus not egocentric, point of view (Berthoz, 2011).

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