

MORAL INTELLIGENCE.
ELEMENTS OF ARTIFICIAL ETHICS FOR COGNITIVE
AND MORAL AGENTS

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Résumé. Un nouveau domaine de l'éthique est produit par l'étude de l'interaction des agents moraux intelligents humains et artificiels. Nommée, dans notre étude, éthique artificielle, cette nouvelle discipline est le résultat d'une synthèse parmi des autres deux domaines émergents de l'éthique: l'éthique de l'ordinateur et l'éthique de la machine intelligente. Ce domaine de l'éthique assume comme objective la formation d'un groupe de valeurs et d'une classe de procédures de décision morales pour des agents humains de même qu'artificiels et formules des anticipations pour leur évolution. Les qualités communes des agents morales humaines et artificiels sont analysées. L'intelligence morale comme une expression unitaire de quelques aptitudes, activités et techniques intellectuelles est étudiée et son statut parmi les autres formes de l'intelligence pratique est décrite. Des techniques adéquates pour traiter les valeurs et les motifs sont préparés. La nature de la valeur morale et le spécifique de la décision morale sont montrés. Les formes de la pensée qui peuvent être utilisées pour modeler la décision morale et qui peuvent être facilement appliquées par la technique sont identifiées. Les niveaux de la conduite morale, le rôle de l'intelligence morale à ces niveaux et la structure intérieur de l'intelligence morale sont discutés. Les conditions qui peuvent faciliter l'utilisation et le développement de l'intelligence morale sont mises en évidence.

The interaction of intelligent (human and artificial) agents generates several new areas of research, including a new ethical research field. This new ethical domain is the result of a synthesis between other two just emerging ethical disciplines: computing ethics and machine ethics. In this paper, the new ethical field will be called artificial ethics, but its first task is to promote new ethical and meta-ethical solutions in the field of human ethics and only in the second instance, to bring up an appropriate and operable value-set for artificial intelligent agents. To be valuable both for human and artificial moral agents is then the most important property of this artificial ethics. The third but indirect result of our study can be an improvement of human morality itself, in the spirit of a renewed meliorism.

Even at its systematic level and in its scientific form, human morality is theoretically deficient and practically inapplicable. However human moral conduct is often effective, because of moral intelligence development and employment. It is moral intelligence – and not necessarily moral consciousness – which ensures the coordination of moral values and actions. But in human morale, we can also observe a departure from ideal values, to general principles and particular rules and finally to actual moral behavior.

How can moral values be put to practice by intelligent machines that use just an abstract form of intelligence? Can “natural evolution” of programs be adapted

for the moral dimension of machine's action? Moral values are synthetic values which require a particular type of knowledge – practical knowledge; a special kind of knowledge is also necessary for their understanding – evaluative knowledge; their general and vague character calls for creative intelligence and their practice may require many psychical (individual) aptitudes and cultural (social) attitudes.

Understanding, reasoning, decision making, problem solving and heuristic conduct are needed in moral (human or artificial) conduct. The unitary expression of these functions/aptitudes is moral intelligence. Task formulation, rules interpretation and consequence evaluation are other intellectual activities subsumed by moral intelligence. Therefore, moral intelligence cannot be simply dismissed as “moral cognition”, not only because of its complexity but also because of its proactive, operative nature.

Even if viewed as an operational branch of moral cognition, moral intelligence is a complex of intellectual activities. In their turn, these activities subsume always used but only recently identified forms of thinking such as fuzzy thinking, fractal thinking, statistical and global thinking, local thinking and integrative thinking. Creative thinking and prospective thinking are also characteristic for this domain. Forms of reasoning from non-sentential to situational and even affective ones are present, each of them representing promising research areas as forms of practical reasoning.

Moral intelligence is different from the technical, political or the (recently studied) economical intelligence, all of them being included in the group of practical intelligence forms. Moral behavior is a complex, practical, intellectual and spiritual behavior. Moral intelligence is operational at all these levels of moral conduct (action, cognition, spirituality) and moreover itself has both concrete and abstract, imitative and creative, assertive and interpretative, persuasive and imperative, individual and group components. Moral intelligence is not a form or a level, but a kind of intelligence, it is a synthetic kind of intelligence. Therefore moral intelligence is not simply a practical intelligence form.

Moral life is mainly a spiritual life, it is the kingdom of value-based choice, of moral reflection and moral freedom. As decision form, moral decision has some characteristic features such as a) universality (all complex decisions have a moral dimension); b) its foundation on specific values together with individual motives; c) the combination between subjective evaluation of difficulty degrees and objective counting of success probability.

If we conceive motives computing as simple succession of motives inventory, identification, comparison and choice, as we are now doing, we are evaluating present or future acts through past decisions and we elude the construction of motives as constitutive substructure of the structure of action. Motives are motivating and just secondarily justifying. Moreover, we always have

to deal with a system of motives (not just to identify the right motive) and to use motivation as the internal (the most powerful) incentive for action.

Decision itself is a process, a distinct and complex activity, not just a component of the activity. The paper analyzes some steps of moral decision and a few types of moral decision, having as criteria situation and motivation. Do we have to “animate” cognitive and operative intelligent agents (knowbots and robots) or can task and value (finality) oriented, situational and concrete, theoretical and emotional intelligence be substituted by forward and feed-back (causality) governed, algorithmic and executive mechanisms? Singularity, un-repeatability and irreversibility of moral decisions are pointed out.

Practicing artificial ethics by using moral intelligence presupposes the use of a set of techniques. Some of these techniques are intellectual techniques such as value measurement, motives analysis, situation exploring and evaluation, decision processes foundation, resources evaluation and allocation, competences and responsibilities establishing, persuasive techniques, prospective techniques.

Moral reflection is conditioned by the construction of a scientific and philosophical superstructure of moral life and habitually represents a lacking level of morality. Machine ethics is facilitated by the possibility to be philosophically founded, scientifically inferred (from ethical theories) and technically implemented.

Freedom must be allowed not just for human, but for artificial moral agents, because the degree of liberty directly determines the degree of responsibility. Moral responsibility implies moral conscience, but this one is “selectively” developed by each individual: just at the level of emotions and then at the level of habits induced from outside by the system of negative/positive sanctions or at the level of beliefs as well as that of reflections. Can instructions and rules, knowledge based techniques and specialized semantic editors play the same roles in machines functioning?

Human morality is even a field of value invention. Accomplishment of new values implies many cognitive, affective and evaluative aptitudes. Even each moral value can be practiced only through some general or even special aptitudes, as well as imagination or intuition, and the central moral value can be realized by integrating the derived values and by the conjoint manifestation of all inner and cultivated necessary aptitudes. Creativity is the result of a psychical super-activity. It is, in addition, a singular process, conditioned by an original organization of aptitudes and by the unique quality and importance of its products.

The creative nature of the spiritual dimension of ethical behavior involves not just consciousness, but also unconsciousness. The unconscious level of psychical life is considered as the infinite and permanent source of creativity. Could a moral conduct demonstrating machine also need the unconscious (mind)? Can this be populated to the same extent as the human unconscious? Can it be productively explored and exploited for the purpose of implementing creative conduct?

As moral agents, human and artificial intelligent agents show some possible common features (we are characterizing 9 of them), some of them being possible to be ensured by moral intelligence. Artificial moral agents do not have to reproduce human moral qualities, but they have to receive or develop some functional, psychical and spiritual abilities. A few “intelligence makers” appreciate that programs and even machines will be obtained by processes which are similar to primordial ones like garden tillage or bred baking and foresee a “natural” evolution of artificial intelligence.

Moral intelligence and moral spirituality transcend biotical, psychical and even social behavior: they are cultural behaviors. But cultural behavior is still a practical behavior (“culture is the way in which values are experienced by people”). Thus, artificial moral agents will need to be trained or even “educated” by processes similar to children’s cultural formation.

Implementation of moral intelligence raises difficult problems in the case of both human and artificial agents. But the realization of this task is helped by a) the synthetic nature of moral intelligence; b) the multitude of the implied aptitudes; c) moral values are generated by diverse activity fields, which also offer their specific means for their accomplishment; d) realization of moral values is ensured by cooperation of entities, e) the normative structure of moral conduct; f) the possibility to develop moral techniques as variants of intellectual techniques; g) the chance to apply a wide range of methods (philosophical, psychological, technical; h) the opportunity to conceive and design all practical intelligence forms as clusters of some value/norm guided, task/means evaluating, risk/benefit balanced, ideal/real motivated and present/future oriented activities, not just as capacities/aptitudes.

The specific of artificial ethics is given by its a) way of constitution as a result of a synthetic approach aimed at understanding human and artificial agent’s behavior; b) validity for all types of intelligent agents; c) status of moral invention. As a product of philosophical reflection it is even an intellectual invention. Moral intelligence, as complex of aptitudes, activities and even intellectual techniques regards both the spiritual, cognitive and practical levels of moral conduct. If philosophically founded, deduced from scientific (moral) theories and technically implemented, artificial ethics can improve both human and artificial moral behavior.

Artificial ethics is the term which I find to be adequate for the new ethics which can be efficiently practiced by both human and artificial intelligent agents. Artificial ethics will be born by the common evolution of a few present fields of ethics such as *ethics of computing*, *computational ethics*, *machine ethics* and the *global information ethics*.

Destined for computer and net workers with diverse professions, *ethics of computing* is useful for all those who use a computer in the new artificial intellectual environment. Issues such as the protection of software property, of user

identity and privacy, and *netiquette* sharing and preservation are considered characteristic for this ethical field. Ethics of computing is not a professional ethics.

Accredited moral theories are studied and decision procedures for difficult moral problems are conceived in the field of *computational ethics*, created by professionals in philosophy, who use computers for theoretical and practical moral problems solving. P. Danielson revealed that important parts of morality have always been artificial; using the computer in this field, we just extend the artificial feature of morality.

Machine ethics concerns the computer itself if it runs intelligent programs because once turned into an intelligent machine, the information machine induces changes in the world, like humans do. All human activities have a moral dimension and a machine with similar possibilities needs moral functions. Machine ethics tends to become a research field of Artificial Intelligence, but it also needs a philosophical (ontological, axiological and pragmatic) foundation.

Global information ethics is rather a new level than a new domain of ethics, generated by the informatization and globalization of all significant human activities. T.W. Bynum and L. Floridi have founded and developed important aspects of ethics related to the present changes in knowledge, communication and work. R. Cavalier pointed out the impact of internet on our moral lives.

Artificial ethics will be not only the result of a common moral evolution of human and artificial cognitive and moral agents, but also a part of *artificial philosophy*, recently generated through the birth of formal axiology, technical logic, information aesthetics or digital politics. Fr. Laruelle viewed artificial philosophy as the science of thinking, developed by mathematical and technical methods.

Moral cognition, as a form of social cognition, can be a scientific knowledge and can be put to practice, as a realization of a moral code, by technical knowledge. At its philosophical level, moral cognition is structured at each level of knowledge: empirical, theoretical and meta-theoretical. At the same time, all forms of human cognition, which are subject matters for the so called *cognetics*, also need, in our vision, a *cognethics*, a field of ethics which can be concerned with the moral use of the results of all kinds of cognition.

Moral knowledge and technical knowledge are or are going to be put together to formulate machine ethics, which is a common research field of philosophy and AI. Characteristics of artificial intelligent agents are studied in this latest domain. We can analyze from a philosophical point of view if these features render these intelligence forms capable of moral action and "life".

Artificial intelligent agents are in fact characterized by classes of attributes: I – Sensing and acting; II – Reasoning; III – Learning and knowledge; IV – Structure; V – Quantity.

Some of the features included in these classes are promising for moral activities; these agents

- act locally
- cooperate
- are sophisticated
- are trustful
- acquire knowledge.

Other features emphasized by computer scientists are not so favorable for ethical purposes.

The intelligent agents realized so far

- are not real-time,
- do not model other agents (but moral behavior is learned or even imitated)
- do not show internal state.

Newer agents like “swarm agents” show some even better traits because they

- share resources
- may discover roles in runtime

but they

- have less autonomy
- react more directly (while moral behavior is a reflective one)
- are less transparent
- use fixed language
- assume information to be true (when we know that “*dubito, ergo cogito...*”)
- are less reusable (maybe they cannot then fully use their capacity to learn).

Specific, artificial moral agents can/must be created and treated as 1 – individual entities (complex, specialized, autonomous or self-determined, even unpredictable ones), 2 – open and even free conduct performing systems (with specific, flexible and heuristic mechanisms and procedures of decision), 3 – cultural beings: the free conduct gives cultural value to the action of a human (natural) or artificial being, 4 – entities with “lifegraphy”, not just “stategraphy”, 5 – educable, not just teachable systems, 6 – endowed with diverse or even multiple intelligence forms, like moral intelligence, 7 – equipped not just with automatisms and intelligence, but with beliefs (cognitive and affective complexes), 8 – capable even of reflection (moral life is a form of spiritual, not just of conscious activity), 9 – components/members of some real (corporal or virtual) community.

These possible features of artificial moral agents make them more adequate to efficiently perform a determined moral code than human ones. Human moral has a complex structure which reproduces, rebuilds or anticipates the frame of social organization and the content of moral values is differentiated by cultural area, communities, social categories and professional groups. Artificial ethics can be derived from sciences like forms of scientific ethics, other social sciences, technical sciences

and sciences of the spirit such as mathematics. It will be homogenous and global, with differentiations only for fields of activity, types of tasks and degrees of complexity.

On the contrary, human morality was characterized by complex successive internal differentiations; among them we can distinguish some persistent dichotomies generated by elementary differences of biotic, psychic, social, historical and cultural kind. Two distinct types of human behavior (individual and social) were perpetuated and transmitted by two different cultural codes:

- 1.1.) a preponderantly creative behavior characterized by analytical capability and meticulousness, industriousness, balanced orientation towards traditions and the future, by the use of personal skills and self resources, respectively
- 2.1.) a partially destructive behavior characterized by synthetic perspective and efficiency, ability, present oriented, recourse to authority by the use of power and even of violence, by the capacity to identify, valor and develop external resources.

Therefore two types of ethics are put into practice:

- 1.2.) an ethics of identity, integrity, continuity and care;
- 2.2.) an ethics of conquest, progress, risk and domination.

The first is characterized by the accumulation of benefic outcomes of life, communication and competence, while the second is constituted by increasing the forms and means of dissension and destruction and by competition.

Both types of ethics are necessary and justified. They are necessary because they represent direction ways of the human communities that allow them to historically move to the present moment and they are justified by theories or even theoretical trends within moral reflection. Human and moral evolution in the present scientific and technical cultural environment tends, in our opinion, to generate a new, more free in spirit but at the same time more strictly regulated morality, which will be an artificial morality when compared to the traditional one.

This new morality, based on philosophical presuppositions, moral sciences and technical abilities will also be the result of a common evolution of the artificial cognitive and operative moral agents. By common activities in the present new technical cognitive environment, human and artificial cognitive agents are gaining some common characteristics. Cognitive techniques are now multiplied at each level of intellectual activity, from the informative to the creative activities. Cognition forms are themselves evolving in all fields of culture and new forms of cognition appear/ are emerging. Some cognitive techniques can be common to artificial and human cognitive agents. Applied by humans and machines, who can meet halfway between the natural and the artificial, these cognitive techniques can facilitate a common, faster evolution.

Even if nonscientific and characterized by dichotomies, human moral was until now efficient because of the use of a specific form of human intelligence: we are naming this intelligence form **moral intelligence**.

The complex structure of moral conduct as a form of practical and spiritual life as well as its role in organizing and conducting the life of the individual and community respectively, impose a corresponding type of intelligence, moral intelligence, as well as the necessity to cultivate it in the case of man and at the same time the obligation to implement it in the case of intelligent machine in its interaction with man.

Human intelligence has not always been studied with an equal attention for the various types of intelligence (nor even in the specialized field of psychology), being highlighted the better studied forms, the classifications being made following criteria of unequal importance. From here we have a great number of classifications, some types of intelligence appearing under several classifications.

We are trying to build a systemic and structural point of view about human and artificial intelligence. Human intelligence has been progressively analyzed, by the identification of a general factor, then semi-general factors and finally by studying certain specific factors, all these having been correlated in a special model inclusively.

Some studies highlighted peculiarities of human intelligence such as technical intelligence. Taking into account the aptitudes, the type of education and activity as well as the experience and the specific environment, other types of intelligence emerge, such as linguistic, mathematic or musical intelligence.

We propose a unitary criterion following classification of intelligence. This unitary criterion can be the field of culture through which the main intelligence forms are set up and manifest themselves. The proposed classification is able to comprise various types of intelligence which are now included in several different classifications as it is the case of mathematical intelligence, literary intelligence, interpersonal intelligence or social intelligence.

Following the proposed criterion we can distinguish scientific intelligence, artistic intelligence, technical intelligence, political intelligence and moral intelligence, etc.

In this classification there are some new aspects, some methodological and terminological and two of them theoretical.

Thus, despite the thorough study of mathematic, linguistic, practical and theoretical intelligence, *scientific intelligence* has not been thoroughly studied and the terms used were not adequate. Also despite the research into musical, plastic or kinesthetic intelligence, *artistic intelligence* has not been studied yet. Moreover, in spite of the fact that numerous classifications include interpersonal intelligence or social intelligence, organizational intelligence has not been thoroughly analyzed. Political intelligence, one of the most influent manifestations of organizational intelligence, has not been analyzed either.

We therefore propose moral intelligence as a research topic. From the perspective of this subject matter we are going to make further specifications, comments and analyses.

The analysis and nominalization of an intelligence form unidentified so far but functional, namely the moral intelligence, presupposes the argumentation of the necessity to study it and to use the mentioned name. We have two categories of arguments.

The first group of arguments refers to the status of morality as human phenomenon, as component of spiritual life and consequently as aspect of cultural activity.

Moral conscience sets up step-by-step, but once its superior levels are developed man does not act as a consequence of its moral constraints, but following an interior spiritual debate.

Moral values form a peculiar value system within the general value system characteristic for the society. The realization of such a system requires the construction, cultivation and manifestation of an ensemble of consecrated human aptitudes, among which a determined type of intelligence, moral intelligence.

Moral conduct presupposes even the combination in a distinct form of intelligence, moral intelligence, of several types of intelligence already studied. Besides abstract and emotional intelligence we also mean concrete, descriptive, interpretive, imitative, creative, theoretical and practical intelligence.

The name moral intelligence that we have given to this complex form of intelligence which conditions efficient moral behaviour, is based both on the complexity of moral knowledge and the structural hierarchy of moral conscience. We also add the specific of moral relations and practices which impose the development and the utilization of this distinct form of intelligence.

We have argued in a previous study that the analysis of human aptitudes involved in moral conduct may extend to the identification of the aptitudes necessary to realizing each moral value, and the realization of the fundamental moral value involves the practice of all the other moral values.

The second group of arguments comes from moral practice as a fundamental form of practical conduct. The distinct types of intelligence are formed, cultivated and manifest themselves with respect to the peculiarities and requirements of various types of activity.

The study of the moral form of intelligence can be similar, from this point of view, to that of technological form of culture.

Moral intelligence cannot be confused with general intelligence, although it manifests in all types of human activities. This type of intelligence is active and efficient in specific moral contexts, but such contexts exist in all fields of activity and each person lives moral experiences, irrespective of his/hers professional work.

At the same time the level of moral intelligence cannot be considered dependent of the level of general intelligence, but the degree to which moral intelligence manifests itself can be much different from the possibilities offered by

the level of development of general intelligence and even from the level of some specific forms of intelligence. Thus, the level of moral intelligence, evaluated by taking into account the degree and efficiency of its manifestation, seems to depend mostly on moral conscience and on the extent to which its various components are present, active and inter-functional.

The exercise of moral conscience is related to the concrete life and activity of the individual. We can state that it exists to the extent to which it acts, and this statement is valid for moral intelligence too. Moral intelligence depends not so much on more or less complex aptitudes, i.e. psychical factors, but on spiritual, educational and cultural factors.

Nevertheless, to implement a moral code in the behavior of machine we can use the results of the study of several characteristics of human intelligence which show that it decomposes into aptitudes (verbal aptitude, numerical, reasoning, memory, etc). The forms of human intelligence including moral intelligence could be reconstructed into technical variants starting from such aptitudes, expressed in functions adequately described which could simulate moral judgment and complex reasoning specific to this field of spiritual activity.

Moral intelligence cannot be understood in our opinion as being a peculiarity of general intelligence as its determination in this way produces difficulties. Moral is a field of culture, morality is a complex of human relations, moral activity generates a subsystem of the social system, but man, to prove moral and to manifest moral intelligence cumulates and uses characteristics specific to several forms of human intelligence.

We can even say that moral intelligence involves the use of several types of human intelligence. Thus at the level of moral relations and activities we need concrete intelligence and practical intelligence, imitative intelligence but also creative. Life in moral community implies interpersonal intelligence and emotional intelligence. The scientific level of moral knowledge (scientific ethics) presupposes theoretical intelligence.

These changes initiated in the philosophical and psychological theory of intelligence also presuppose certain changes in the accredited language of these fields. The proposed terminology comes out of a systemic methodological perspective associated with an integrative vision, within which we can talk about the moral intelligence in the typology of human intelligence.

The particularized forms of intelligence can include specialized forms of intelligence which will each be included, only once, in a single category. Such specific forms of intelligence are set up in accordance with the requirements of some fields of activity, the characteristics of a scientific subject, an artistic genre or a development direction, in conformity with the norms derived from the exigencies of a given value system, such as the moral ones.

If we have in view current specializations of ethics, such as bio-ethics and techno-ethics or emerging domains such as machine ethics we notice that their development presupposes mathematical intelligence and even technical intelligence and besides specialized knowledge also the availability for philosophical reflection. Moral philosophy involves abstract intelligence and creative intelligence.

The understanding and the use of moral values, as a result of spiritual activity requires, on the one hand, descriptive intelligence and crystallized intelligence, but is based on interpretative intelligence and even on creative intelligence. The efficiency of social activities, which all imply moral values, is conditioned on the use of social intelligence.

From the analysis of the forms of intelligence presupposed, involved and integrated in the existence and use of moral intelligence we notice that moral intelligence is based on general intelligence, it combines in its functioning and components specific forms of intelligence and to cover new fields of activity it uses special forms of intelligence. Consequently, **moral intelligence represents, in fact, a synthetic form of intelligence.**

One of the ways that will make possible the integration of this complex form of intelligence with the artificial intelligence is the very study, as analytical as possible, of moral intelligence. If we carefully analyze other fundamental forms of human intelligence, we would notice that they are all synthetic forms of intelligence and that the force of human intelligence as a whole consists of the general intellectual availability to solve any problem, as of the ability to focus intellectual complexity on singularity.

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