Towards Artificial Social Constructivism

Jan-Philipp Steghofer, Ada Diaconescu, Steve Marsh and Jeremy Pitt

"Do you trust me?" "Can you do me a massive favour?" "I now pronounce you man and wife!" "Do you have a loyalty card?" "There's no justice." "I can't break the law." "That's private." "Thanks for the present."

These expressions, and countless others like them, are commonly encountered every day of our lives, so much so that they are as taken for granted as, for example, night following day.

But each expression illustrates a fundamental distinction, between, on the one hand, a *physical* reality that (*pace* philosophers from Descartes onward) is known through sensory experience which, if only for the sake of convenience, we can assume is the same that others experience and would continue to exist independently of ourselves; and, on the other hand, a *social* reality which, to the extent that it exists at all, only exists as a product of a shared and jointly constructed mental state; and moreover this social reality ceases to exist the moment the minds cease to exist, or even just forget about it.

For example, consider the phrase, uttered by A to B: "Can you do me a massive favour?" Without formalizing this relationship through some form of written contract, the "favour" represented as the facts that "B has done a favour for A", and that "A owes B a favour" only exists in the minds of A and B and the shared social reality they jointly construct. An external observer, unaware of this prior interaction, might struggle to explain A's subsequent behaviour, for example in terms of a rational agent attempting to maximize its utility, when A's actions are actually motivated by returning the favour. Note also that this notion that A should – is obliged to – return the favour is itself a product of the shared social reality: that there is rule, unwritten anywhere, and independent of any physical constant or physical law, that if B does a favour for A, then at some time in the future, A should do a reciprocal favour for B. Note also the subjectivity involved here: favours are not bound by the social reality equivalent of Newton's third law (for every action there is an equal and opposite reaction), what is a "massive" favour for A may be "no skin off the nose" of B; and consequently the reciprocal favour could involve considerable investment by A and be far greater than B thinks was merited, perhaps motivating B's subsequent pro-social behaviour towards A (although according to the Ben Franklin effect, B doing a favour for A makes B more likely to do *another* favour for A than if B had been the recipient of a favour from A)[1].

Similar observations can be made for all the other example expressions: trust, loyalty, justice and privacy and so on are all products of social reality rather than physical reality. The marriage announcement is an example of the exercise of institutionalized power and the distinction between what have been called "brute facts" (facts which are true by virtue of physical reality) and

"institutional facts" (facts which are true by virtue of conventions and mutual agreements in social reality", analysed with the idea of "counts-as", that X counts-as Y in context C2. Thus a speech act of the form "I pronounce …" performed by a designated agent occupying a specific role (i.e. the priest) in a pre-determined context sees to it that, according to the institution of the church married(M,W) (where M designates the man and W the wife) is true. The example of "I can't break the law" shows how sometimes social reality can be elevated so highly that it is conflated with physical reality, and conventional rules (e.g. laws) are treated as if they "really" exist and have the same unbreakable status as, say, the law of gravity.

These ideas and related phenomena have, of course, been studied in philosophy, sociology and communication theory for many years, in particular social constructivism[2,3], which argues that human development is **socially** situated, that knowledge is constructed through interaction with others, and that the idea of social reality consists of mental constructs that are constructed with the aim of explaining and participating in social groups. Accordingly, social values, relations and concepts are constructed by and through social networks and other social processes (such as behavioural change) underlying a community.

Given this, our concern as software engineers acting in the intersection between technology and society is this: what happens when computer systems intrude into, impinge on, or participate in this humanly-oriented, jointly-constructed, conventionally-manufactured shared understanding of social reality? This question needs to be urgently addressed as complex socio-technical systems (composed of both human and artificial "processors") and so-called "smart" systems (smart cars, smart grids, smart cities, etc.) become increasingly prevalent, and feature artificial components that necessarily have to represent and reason with social concepts, social constructs, social processes and social interactions – like trust, loyalty, privacy, laws, morals, ethics, justice, values, favours, friends, etc. – in order to participate meaningfully and pro-socially in a socio-technical system.

Accordingly, the four papers in this special issue touch on four different social concepts and their application in the design, implementation and management of socio-technical systems…

One ambition for this special issue is to provoke a discussion about what might, eventually, be a new field of scientific endeavor, that might be called *artificial social constructivism*. Artificial social constructivism is the computational (re)construction of social reality, that examines the development of computational models of humanly-constructed shared understandings of the world, that themselves provide the basis for communities, collective action, social networking, and relational economies.

[1] C. Tavris, E. Aronson: Mistakes Were Made (But Not by Me) (Harcourt, 2007).

[2] P. Berger and T. Luckmann: The Social Construction of Reality : A Treatise in the Sociology of Knowledge (Anchor, 1967).
[3] J. Searle: The Construction of Social Reality (Free Press, 1995).