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## Keynote: Intelligence vs. Self-organization in an Hybrid Society, Cristiano Castellfranchi

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# Keynote: Intelligence vs. Self-organization in an Hybrid Society, Cristiano Castellfranchi

From natural and artificial to hybrid social intelligence: Towards socio-cognitive technical systems

The current explosion and widespread adoption of social network services is deeply impacting how human societies function. Though the impact of these new technologies in the long run is difficult to assess, a major problem stems from the way such technologies are designed. In the absence of a rigorous understanding of how societies work, evolve and change, social network services risk to unintentionally cause deep and structural social change with unforeseen negative consequences and to miss opportunities for positive social innovation. Although social network technologies are nowadays already fused with human sociality, the future emerging societies are at risk of becoming an unpredictable mutant.

Consider the problem of privacy. Social network technologies are inevitably changing the way the private and public spheres are conceived by the new generation of digital natives. Social network technologies are inadvertently promoting new social norms and unintentionally changing human self-conception. As an unintended side-effect, a constitutive conception of personhood and autonomy might be eroded.

There is thus the need for a new generation of tools for human societies. These new tools should be conceived from the start on the basis of the core principles characterizing human societies and human cognitive development, should be designed with a view to socially desirable outcomes, should be aware of the subtleties that are intrinsic to human sociality and be able to anticipate and monitor the inevitable new spontaneous social order.

Indeed, as is well known, one peculiar feature of human societies is that they are based on a level of cooperation that is not achieved by any other biological species and was for a long time left unexplained. During the last decade, however, there has been an enormous rise in the scientific study of human cooperation, and nowadays there is a consolidated body of theoretical and empirical results that explain how cooperation in human societies is indeed possible. Such a conceptual toolbox has been the product of a merging of different disciplines: from biology to economics, from sociology to cognitive science. This interdisciplinary approach to natural social intelligence has identified a number of mechanisms that support human societies (like reputation, punishment, trust, norms and social and legal institutions, etc.) and has developed new formal and conceptual frameworks to approach these problems.

At the same time of the explosion of cooperation studies in the social sciences, computer science has given birth to artificial social intelligence: from early distributed artificial intelligence in which a massive number of autonomous intelligent computational entities interact in order to achieve collective objectives to the domain of Multi-Agent Systems in which software applications have been designed from the scratch as societies of software agents. Still, this artificial social intelligence has been conceived mainly as a closed artificial society mirroring human ones but with no real interaction.

A new generation of tools for human societies is however possible. By promoting a new interdisciplinary alliance between the cognitive sciences, social sciences and computer science, new paradigms to design a new form of hybrid - partly natural and partly artificial - social intelligence can be developed. These future systems will support human-like social features like cooperation, trust,

norms etc. They will be anchored on the complexities of human cognitive systems. As a consequence these systems that will be partly made of autonomous and intelligent entities and partly made of humans, will be able to embody crucial principles of human sociality and offer new ecological niches. In order to build such systems, there is the need to promote interdisciplinary research between computer science, engineering, cognitive sciences, philosophy, economics and sociology.

This is the era of Socio-Cognitive Technical Systems.

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<http://www.sintelnet.eu/wiki/garbage/docs/sourcebook/positionpapers/SCTS-Castelfranchi&Tummolini2.pdf>

## Slides

[castelfranchi-ecsi14.ppt](#)





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Section header: **Why 'Foucault'?**

Section header: **Architecture and Capitalism**

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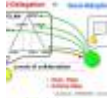
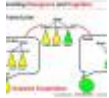
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### 5 Dilemmas, Paradoxes, Ethics, Values, Virtues in Human Society

"The State is essential to control  
the chaos in which we live"  
"The State is essential to control  
the chaos in which we live"  
"The State is essential to control  
the chaos in which we live"



**Dilemmas of Democracy**  
of all dilemmas democracy, because  
of its complexity, is the most  
difficult to understand. It is not  
only based on "good ideas" but also  
on "bad ideas" and a search for  
the best way to reach the best  
solution.

**Identifying Truth  
and Sustainable Growth?**  
Sustainable growth is not  
sustainable if it is not based on  
truth. Truth is not sustainable  
if it is not based on growth.  
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### 5 Think About Values & Categories, and Qualitative Functions and Capabilities

It is not possible to think about  
values without thinking about  
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### 6 Social Structures, Social Institutions, and Social Management

Social structures are not  
social institutions. Social  
structures are not social  
institutions. Social structures  
are not social institutions.  
Social structures are not  
social institutions. Social  
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institutions. Social structures  
are not social institutions.



Introduction and Motivation

...the main motivation for this work is the need to understand the relationship between intelligence and self-organization in a hybrid society...

The Simulation Results

...the simulation results show that the system exhibits self-organizing behavior under certain conditions...

political issues and challenges

...the political issues and challenges in a hybrid society are complex and multifaceted...

political issues and challenges

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Concluding Remarks

...the concluding remarks highlight the importance of understanding the relationship between intelligence and self-organization...

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**Open & Cooperate**  
El mundo está cambiando y las organizaciones deben adaptarse a un entorno más dinámico y colaborativo. La apertura y la cooperación son claves para el éxito en el futuro.

**Resiliencia**  
La resiliencia es la capacidad de recuperarse de situaciones adversas. Es una habilidad que se puede desarrollar y fortalecer a lo largo de la vida.

**El Futuro de la Inteligencia Artificial**  
La inteligencia artificial está transformando la sociedad y el mundo del trabajo. Es importante entender sus implicaciones y prepararse para los cambios que traerá.

**MEMO**  
Este documento resume los puntos clave de la conferencia. Incluye información sobre los ponentes y los temas tratados.

**El Futuro de la Inteligencia Artificial**  
Continúa el análisis sobre el impacto de la IA en la sociedad y el futuro del trabajo.

**El Futuro de la Inteligencia Artificial**  
Sección de cierre de este tema, destacando las conclusiones y recomendaciones.

**El Futuro de la Inteligencia Artificial**  
Resumen de los debates y preguntas planteadas durante la sesión.

**El Futuro de la Inteligencia Artificial**  
Sección de agradecimientos y cierre de la conferencia.

**El Futuro de la Inteligencia Artificial**  
Información sobre los próximos eventos y cómo seguir participando.

**END**  
Fin de la conferencia. Gracias a todos los participantes por su presencia y contribución.

**El Futuro de la Inteligencia Artificial**  
Resumen de los temas tratados y enlaces a recursos adicionales.

**El Futuro de la Inteligencia Artificial**  
Sección de preguntas frecuentes y respuestas.

**El Futuro de la Inteligencia Artificial**  
Resumen de los puntos clave de la conferencia.

**Conclusiones**  
Resumen de las conclusiones principales de la conferencia.

**El Futuro de la Inteligencia Artificial**  
Sección de agradecimientos y cierre de la conferencia.

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## Quick notes

Socio-technical systems require new skills, conventions, a new view on almost everything. Physical and virtual intermixed. Requires augmented body and augmented mind because we live in an augmented reality living at the same time in two worlds.

This organisation cannot be planned, it is an spontaneous order, it emerges.

- Not only bounded rationality (Simon)
- but COMPLEXITY
- but COMPUTATIONAL INTELLIGENCES
- for the intrinsic blindness typical of organized institutions

### We need a new Simon for explaining rationality at the collective level

#### 1. General perspective

The COGNITIVE MEDIATORS of Social phenomena, richer cognitive models for “artificial intelligences”

COGNITIVIZING: cooperation, conflict, power, social values, commitment norms rights, social order, trust

Pareto, Garfinkel: social sciences as opposed top psychology. We need to go back.

We need MIND READING because agents behaviours are due to the mental mechanism creating and controlling them.

Una teoria del cerebro que evita la mente no permite entender las inteligencias artificiales.

Social interactions are artifacts not only for coordination but to predict and prescribe the mental states of participants. THE CENTRAL DEVICE IS MIND PRESUPPOSING AND MODIFICATION.

- We need MIND MODIFICATION models: goal adoption and goal induction, m mind and other's mind
- social coordination works “as if” they have a mind
- MIND is a social artifact. our social minds are social institutions
- ASCRIBED and ENDOWED minds are crucial coordination artifacts because they crete the common ground, shared knowledge.

- COMMUNICATION is also for shapingmind

## BUT MIND IS NOT ENOUGH

- The social actors do NOT understand, negotiate and plan
- Identify the MENTAL MEDIATOR. unavoidable alienation, Leviatha Demo-crazy
- Necesitamos entender como construimos algo que no entendemos aún.

## MIND NOT ENOUGH - SELF ORGANIZATION

- emergence & inmergence
- emergence cognitive, dependence in network, interference in the world
- spontaneous social order: Friedrich Hayek: emergence must be functional. (Hayek: Knowledge. Market. Planning)
- Adam Smith invisible hand: teleological nature of invisible hand to pursue social order. Ideologism, too much positive. Must be rejected but social order is emergent as Smith said.
- How is posible that we pursue something that is not an intention of ours?

## 2. Theory of function

theory of eemerging functions among cognitive agents NEEDED

In an hybrid world we can reduce guman affective handicap providing more reliable data

Social functions require an aextracognitive emergence working the efectiveness of social function is independent of agents understanding of this function on their own behaviour

Two finalistic systems

- goal oriented
- goal governed

Functional OK, teleological no.

KAKO-FUNCTIONS POSSIBLE?

- cannot be explained in behaviouristic or reincorcement scenarios
- notion of function as SELECTING and REPRODUCINGits own causes
- we need COMPLEX REINFORCEMENT LEARNING FORMS operating on GOALS and BELIEFS, thts is, in the cognitive representations
- example of kakofunction: dirty and clean screens
- institutional level vicious circles: prisons reproduce delinquency
- FUNCTION is something SELF REPRODUCING AND SELF PRODUCED, emergent

## 3. Blind sociality

Obey norms blindly make norms work because the issuer see norm as a tool for a problem. We trust that norm is for social good. Socrates taking the poison. But there is a part of the norm that has to be understood partially.

We blindly reify, objectify power. We dress theking with our eyes.

The “mistakes”, like the idea of god, works very well socially. Doesn't depend on existence.

## Social Control

- MANTENER CONTROL: delegar en IA el COMO conseguir una meta pero no dejar que escoja CUAL meta conseguir
- OPEN DELEGATION, transparently let know all goals
- AVOID UNAWARE COOPERATION, better goal adoption instead of goal delegation

We need adjustable autonomy

- MONITOR PEOPLE to understand why they need to violate norms: possible danger of formalization and enforcement of rules.
- Violations sometimes produce better functionality.

## Concluding remarks

- we are engineering a new society
- reconcile emergence, self-organizing with intelligence, people participation
- self organization = out of mind
  - society works thanks to our PARTIAL INTELLIGENCE, not knowing whats going on at social level
  - will invisible hand become a computational invisible intelligence orchestrating societies? PRESERVE SELF-ORGANIZATION
  - reconcile emergence and cognition
  - en sociedades híbridadas se necesita información para que la gente que conozca el cuadro completo de normas y todos los efectos
  - alienation
  - worry: net-demagogy
  - Mark Twain: si votar pudiera cambiar el orden social no nos dejarían hacerlo

The book [Computational intelligent data analysis for sustainable development](#): shows how predicting without understanding is possible in this area also

Science will be computational or will not be

- AI (Artificial Inleggigence) was the first attempt
- not just models but EXPERIMENTAI PLATFORMS, VR

The Goal-Oriented Agents Lab (GOAL) is an interdisciplinary group that carry out research on finalistic behavior in intelligent agents. Key areas of activity are Cognitive Systems, Social Cognition, Action Control, Decision Making, and Emotions. Since the 70s, members of the group developed a novel approach to cognition, known as goal theory. [www.istc.cnr.it/group/goal](http://www.istc.cnr.it/group/goal)

## Q&A

- Formalizacion no es necesariamente mala, lo malo es crear un modelo social en el que la violacion de la norma no este contemplado
- Big data es como la gravedad, desde Newton sabemos como funcona en la practica, es una ley,

pero no es una teoria porque nosabemos que es realmente. con Big Data encontramos resultados espectaculares de prediccion minando grandes cantidades de datos pero no entendemos los mecanismos sociales que intervienen.

- social simulations
  - with insects we predict social complexity
  - we explain without cognitive agent. that's true
  - technology for collective intelligency
  - VDI is just an preliminary step
  - do we need an emotional mind always in simulations? castelfranchi thinks not
- there is no technical perfect solutions to political problems because the cause is here are CONFLICTING PERSONAL INTERESTS

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