COMPLEXITY AND PHILOSOPHY
A NON-REDUCTIONIST APPROACH TO ETHICS

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AIMS

1. Present and challenge the idea of “simple ethics”
2. Present a possible alternative
3. Evaluate its implications
1. A game
2. From reduction to systems theory
3. Complexity theory
4. Complexity ethics
5. Discussion
1. A GAME
FROM THE BEST TO THE WORST

Please consider the following story and put the characters in a moral hierarchy considering their behavior. Argument your decision.
1. A GAME

- We are in Venice, and thanks to a **bridge** people can freely move to and from the mainland.
- **Francesca** lives in Venice. **Marco**, her boyfriend, lives in Mestre, on the mainland.
- An earthquake **destroys the bridge**; most of the boats sink.
- Francesca decides that she wants to **cross the sea** to stay with her boyfriend.
- She goes to the port looking for one of the few remaining ships, but **no boatman wants to help** her...
- ...besides one, **Alvise**: he accepts to bring her to Mestre, but in exchange for a **night with her**.
- Francesca **asks advice** to **Agnese**, her mother; she says that she should **decide on her own**, and no matter the final choice, **she will support her**.
- Francesca **accepts** Alvise’s offer, **spends a night** with him an the day after **leaves for Mestre**.

“The world without Ponte della Libertà would be an island”

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In Mestre she meets Alessandro, her boyfriend’s friend. He says that Marco moved to the Alps, and Francesca doesn’t have any money for the trip. Alessandro offers her a job so that she can earn the money she needs. After a couple of weeks Marco, the boyfriend, gets some news about Francesca: the boatman, the hard choice, the need to earn some money… He discovers also that Francesca now has to live with Alessandro, working for him. So, quite angry, he travels to Mestre, has a row with Alessandro, punches him in the face and takes Francesca with him to the mountains.
THE CHARACTERS

Francesca, the girl
Marco, the boyfriend
Alvise, the boatman
Agnese, the mother
Alessandro, friend of Marco
WHAT ARE WE DOING?

Relying on the evidence we have, we are breaking up a complex problem into smaller, simpler ones. We try to identify:
1. the morally significant characters;
2. the morally relevant properties of their actions.
Then we are comparing them with some abstract principle of justice or of fairness or more in general of good. Finally, we compare the characters one to another, in order to build our classification. As a last step, we draw from evidence again to justify our choice.

This is a Cartesian approach to a moral deliberation.  
(R. Descartes, 1637, Discours de la Méthode, pars III)
1. A GAME

This works only under certain conditions:

- We trust the account as comprehensive and unbiased, believing in fact in the possibility of objective access to phenomena;
- We assume the story as a closed system, with no input from or output to the real world;
- We regard motivations as not accessible and we don’t care about them, or we just assume as true our hypotheses on them;
- We assume the existence of some universal values, valid for every character in the same way.

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...de facto, reducing the world to an abstract (probably unfit and surely arbitrary) **approximation**.
...BUT WHAT IF:

There are other **morally relevant properties**?

- Francesca is 15 years old
- Agnese is drunk when Francesca asks for her advice
- Alvise is Francesca’s father
- “Spend a night” means “go to the theater and then have a pizza”
- Alessandro is a pimp and “offers a job” means “makes her prostitute”
...AND IF:

There are other **morally significant stakeholders**?
A mother with a sick children also looking for a ride to the Hospital in Mestre;
Other people needing a job in Mestre;
A pantheon of half-squib gods offended by certain actions;
...

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...AND IF:

The stakeholders have **different, conflicting principles?**

- Agnese prizes autonomy and is an **old school radical feminist**, always confronted with the need to act as such;
- Marco values **beneficence** at a point that justifies even **strong paternalism**;
- Alessandro is a **straightforward libertarian**;

...
It seems that breaking up a complex problem to simple ones, solving them and then assembling the “atomic solutions”, forces us to rely on a oversimplified picture (like the horrible sketch I have drawn a few slides ago). Shall we rely on this as our only way to make moral judgments, or it is possible to imagine a different way?
2. FROM REDUCTION TO SYSTEMS THEORY
Newtonian Science:

- A simple paradigm (few key principles)
- Heavily relying on reductionism (Heylighen, 1990)
- Ontologically grounded on:
  - Matter
  - Space
  - Time
  - Forces/natural laws
- Correspondentist epistemology (as in X Files’ famous poster, “the truth is out there”) (Turkin, 1990)
- Human agency exist only as the separate ontological category of “mind”
- At best, the notion of purposeful action is reduced to the utilitarian ideas of “rational choice” and “maximisation of utility” (which in this context is the only way to universalize “good”).

All neat and nice. Well, at least until Heisenberg’s uncertainty principle and quantum mechanics. (Feyerabend, 1975)
Holism and emergentism:

- The tendency of a whole to be more than the sum of its parts, presenting emergent properties
- Properties that are of the whole, but not of its components
- It happens that a lot of properties that actually matter to us turn out to be emergent:
  - Beauty of a picture
  - The property to pump blood of the heart
  - (Probably) the conscience
  - The driveability of a car
  - ...

(Smuts, 1926)
2. FROM REDUCTION TO SYSTEMS THEORY

Jacopo Tintoretto, La creazione degli animali, 1550

Some of its pixels, 2018
Although intuitively appealing, holism was missing a solid scientific foundation, referring more to mystical traditions rather than to mathematical models or experimental evidence.
2. FROM REDUCTION TO SYSTEMS THEORY

General system theory (von Bertalanffy, 1973):

- Considers a given entity as a **system**
  - Which is **open** (exchanges input/output with others)
  - But is **separated** from others by a border
  - Tends to **couple** with other systems, building **networks** of information/energy/matter
  - When a certain network displays a **coherent functioning**, it can be considered as a **supersystem** composed by **subsystems**
- **Grounded** in biology and mathematical models
- Provides a **scientific background** to the notion of emergent properties
- Relies on a “**black boxes ontology**”, (Bunge, 1963) i.e:
  - The building blocks of reality are **abstract relations**, not material particles
  - The relevant property of a system is not its **substratus**, but the way it **functions**
2. FROM REDUCTION TO SYSTEMS THEORY

An advertising campaign questioning the concept of “black boxes”

Terry Prachett’s “iconograph”, a photo camera working thanks to an imp trained as a painter
2. FROM REDUCTION TO SYSTEMS THEORY

Bidirectional causation

- Subsystems determine (some of) the properties of the supersystem they are part of
  - Upward causation
  - Supersystems determine (some of) the properties of the subsystems they contain
    - Downward causation

Because of this interdependence, the “atomic” properties are less important than the properties, the relations and the state of the systems. (Campbell, 1974)

Thus general system theory does not renounce to reduction/analysis, but it joins it with emergence/holism.
CONSEQUENCES!

If this is how the things are, knowledge is de facto:
- Local
- Depending on the relations of a system
- Subjective
- “Merely a tool used by an intelligent agent to help it achieve its personal goals” (Popper, 1945; Heilighen & Joslyn, 2001)

Therefore, how we build our own model of a system (cognitive and social processes) is more important than how a certain system actually is.

→ the structure of a system is not given, but developed adaptively by the system in its interactions.
3. COMPLEXITY THEORY
A RADICAL ALTERNATIVE

Aims to **overcome** the modernist (Newtonian/Cartesian) paradigm.

Rooted in:

- Non-linear dynamics/statistical mechanics (as a model)
- Computer science (as a tool for modeling)
- Biological evolution (as a model)
- Social systems (as an empirical context for testing theories)

*(Waldrop, 1992; Holland, 1996)*
Complexity Theory:

- Focuses on the “edge of chaos” (systems that are not just deterministic neither only probabilistic) (Langton, 1990)
- Relies on the notion of complex adaptive systems
  - Multi-agent
  - Black box-like
  - Acting locally by blind variation to preserve local fitness
  - Intrinsically uncertain about the remote effects of an action
  - Often conflicting one with the other
MUTUAL ADAPTATION

The order that we see around us is nothing but the “global (or supersystemic) fitness” resulting from endless iterations of self-organization cycles caused by mutual competition aimed to local fitness.

→ Organization is an emergent property of supersystems.
3. COMPLEXITY THEORY

An example:

- The local fitness on the system “cat” is to eat as much mice as possible in order to survive.
- The local fitness of the system “mouse” is to survive without being eaten by a cat.
- Both these systems are part of a supersystem with constrained resources (a barn, for instance).
- The supersystem stays balanced as long as the cats eat enough mice to keep their number low (otherwise they would finish the food and starve to death) but not too much to extinguish them (otherwise they will be the ones that starve to death).
- If we open the supersystem, including more mice food (or a farmer from Vicenza), the entire supersystem needs to find a new condition of global fitness.

(In)famous culinary traditions in Vicenza
FITNESS INTERDEPENDENCE

As well known in ecosystems theories, (and as seen in the example) often the global fitness relies on sub-optimal local fitness conditions. Hence local (systemic) complexity (i.e: the ability to play many different strategies) becomes a key instrument to answer to a complex (supersystemic) environment. (Kauffman, 1995; Dawkins, 1976)
An example:

- The local fitness of an organ procurement organization (OPO) is to have as much donors as possible.
- Hence it lobbies to pass a new bill introducing opt-out organ donation.
- But this happens in an impoverished society with a deep mistrust and a high taxation, where people strongly believe that “the State wants to squeeze you like a lemon.”
- And actually the rate of donors drops down.
- Finally, the OPO accepts a suboptimal local fitness (opt-in donation), but this “call to responsibility” feeds a positive feedback cycle, and the donor rate rises.

(Emmanouil K. Symvoulakis et al, 2013; Alejandra Zúñiga-Fajuri, 2015)
On a certain level, it might seem that human agency displays such features that we would describe as “intentional” rather than “random attempts at something.” We go in a certain direction because we know that taking a different one will likely result in a failure. In fact, this means nothing but having an internal representation of our supersystem, where we keep killing countless hypotheses to select the best ones, rather than killing ourselves “out here”.
4. COMPLEXITY AND ETHICS
“Doing good”:

- Principlism relies on fixed principles considered to be objective → “act according to these principles”
- Utilitarianism relies on the notions of “rational choice” and “objective happiness” → “pursue the increase of happiness”
- Natural law ethics rely on non-realistic, optimistic and positivistic notions of men and human agency → “do not violate natural laws”
- Virtue ethics relies on notions such as “purpose” and “objective good” and “objective value” → “act in a virtuous manner”
- Kantian ethics relies on the notion of an objective and absolute moral law, true in every situation → “act so that if your action is generalized it is still good”
“DO THE EXACTLY (AND UNIVERSALLY) RIGHT THING”

... Has been the key tenet of moral philosophy, assuming that there is such a possibility, and that an external fixed principle is the solution.
FROM A COMPLEXITY PERSPECTIVE

- Considering knowledge as imperfect and local and considering the impossibility to foresee effectively the global consequences of a local action, there is no room for objective principles.
- Every action potentially has moral implications, thus requires an ethical deliberation.
- To do so we must premise that every deliberation we might make has only a local valence.
- And then we can assume “doing good” as “improving the global fitness of a supersystem with the least possible damage to its subsystems.”
This **deflationary approach** to ethics still allows some sort of **foundationalism**, along with the relativistic definition of “doing good”, **without falling in contradiction**.

- **Relativistic:** “**improving the global fitness of a supersystem with the least possible damage to its subsystems**”.
- **Foundationalistic:** “**complexity, intended as the number of inter- and intra- systemic relations is a universal value because it is what a system needs to keep existing, (assuming existence as a good thing)**”.

The foundationalistic definition is also what justifies the second part of the relativistic definition.

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5. DISCUSSION
SUMMARIZING AND DISCUSSION POINTS

- We played a game to **understand the limits** of a **reductionist** approach to ethics.
- We understood the **theoretical background** behind reductionist ethics and explored possible **alternatives**:
  - **Holism/emergentism** – lack of scientific foundation.
  - **General system theory** – misses an explanation for competition and hierarchic chaos in subsystems.
  - **Complexity theory** – integrates some gaps; seems ontologically solid and epistemologically useful.
- We explored a couple of the features of a **deflationary, complexity centered ethics**, elaborating both a **foundational** and a **relativistic** definition of good.
THANKS FOR YOUR TIME.
AND IF YOU GO TO VICENZA, DO LEAVE YOUR CAT AT HOME.

To download this presentation: https://goo.gl/jiLygV