

Metaphysical positions and other terms we use

- **Irrealism**: with respect to a type of entities x (e.g. numbers), one is irrealist about x just in case she denies the existence of x -type of entities.
- **Nominalism**: a variety of irrealism directed to abstract objects (non-spatiotemporal and causally inert, e.g. numbers) or universals (those things that can be instantiated, e.g. the property of redness).
- **Realism**: with respect to a type of entities x (e.g. subatomic particles) one is realist just in case she accepts the existence of x -entities.
- **Phenomenalism**: with respect to a type of entities x (e.g. physical objects) one is phenomenalist just in case she understands the existence of x -entities in terms of collections of mental states (e.g. a set of visual experiences of a table instead of the physical table).
- **Idealism**: the fundamental structure of reality is mental (NB this is metaphysical idealism -e.g. Berkeley-, vs epistemological idealism -e.g. Kant- everything we can know is permeated by the activities of our mind).
- **Physicalism**: the fundamental structure of reality is physical.

Remark:, Irrealism, Nominalism and Realism are ontological positions (i.e. about what there is), whereas Idealism and Physicalism are metaphysical positions about what is the fundamental nature of reality.

- **Nominalism**: deals with the things we measure by means of the specific sensory and cognitive faculties that we possess. The question whether we perceive reality or not is not answered (pragmatism).
- **Realism**: our faculties — much like spectacles, microscopes, and telescopes — do indeed provide us with information about reality.
- **Idealism**: our perceptions and thoughts are not about reality at all, but are entirely about mental objects such as perceptions, appearances, ideas, or concepts, because — for the idealist — that is all there is.

Here are some short-cut definitions of other terms we use

- **Knowledge**: relations between concepts: how this is done relies on your philosophical view of the world (nominalist, idealist, realist,)
- **Representation**: representing logically the concepts. This involves identifying concepts, classes and relations between them. Example: making use of theories like semiotics, mereo-topology and set theory
- **Logic**: first order logic gives relations between concepts (examples OWL_DL; graphs see below, mereotopology), second order logic also allows relations between functions. Taxonomies are limited in their reasoning capabilities as they only can reason on sub-classes. Ontologies have much wider reasoning capabilities.
- **Granularity**: discrete and continuum view of the same object.
- **Relations between granularity levels**: example parthood relations
- **Representation of processes**: many type of processes exist chemical processes, manufacturing processes, translation processes and they need to be described: examples 4D objects that treat materials and processes in a merged way; 3D material objects and separate time evolution descriptions;

- Representation of materials: how do you deal with the different granularity views of one and the same object? If you only have a continuum view that this questions is not answered in your work.
- Connection between physical properties, materials models and measurement: Is there a 1_1 relation in your view?

