Enveloping the World - How Reality Is Becoming AI-Friendly

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Nanotechnology, the Internet of Things, Web 2.0, Semantic Web, Cloud computing, motion-capturing games, smart phones apps, GPS, Augmented Reality, Artificial Companions, drones… is there a unifying perspective from which all these ICT phenomena might be interpreted as aspects of a single, macroscopic trend? Part of the difficulty, in answering this question, is that we are still used to looking at ICTs as tools to interact with the world, when in fact they have become environmental forces, which are creating and shaping (that is, re-ontologising) our reality, more and more pervasively. To put it briefly, the answer may lie in realising that ICTs are enveloping the world - In robotics, an *envelope* (also known as *reach envelope*) is the three-dimensional space that defines the boundaries that the robot can reach.

Enveloping used to be either a stand-alone phenomenon (the robot comes with the required envelop, like a dishwasher) or implemented within the walls of industrial buildings. Nowadays, enveloping the world is an ordinary, escalating phenomenon, which pervades any aspect of reality and is visible everywhere. Indeed, some of our pressing challenges, e.g., in cyber-security, e-commerce, or financial markets, arise within highly enveloped environments in which all relevant (and sometimes the only) data available are machine-readable, and decisions as well as actions may be taken automatically, by applications and actuators that can execute commands and output the corresponding procedures in fractions of a second. Enveloping is a robust, cumulative and progressively refining trend: everyday there are more humans online, more documents, more algorithms, more devices that communicate with each other, more sensors, more RFID tags, more satellites, more actuators, more data collected on systems' transactions, in a word, more enveloping. Enveloping represents a great opportunity for the future of our information society, but how can we ensure that we shall ripe its benefits? What could we do in order to identify, coordinate and foster the best enveloping trends? How could industry and society partnerships for research and innovation in ICT harness the enveloping process successfully? And what are the risks implicit in transforming the world into a progressively ICT-friendly environment? Are our technologies going to enable and empower us, or will they constrain our physical and conceptual spaces and force us to adjust to them because that is the best, or sometimes the only, way to make things work? These are challenging questions, which I hope my talk will contribute to clarify and address.