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Sustainable Development Research: A Topic for AI, Machine Learning & Cognitive Technologies?

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Abstract

Ever since the concept of Sustainable Development first emerged in 1987 as a new intra- and inter-generational equity paradigm, the call for and the urgency of a Great Societal Transformation has gained increasing support by academics, the scientific community, politics and a steadily growing number of societal groups. Representing such policies on a global and regional scale are (1) the UN Sustainable Development Agenda 2030 with its 17 Sustainable Development Goals (SDGs), (2) the Paris Agreement, aiming at reducing and limiting the impacts and risks of climate change, and (3) the European Green Deal striving towards a climate-neutral and sustainable EU.

Meeting the desire of a growing world population for prosperity in a sustainable manner clearly also necessitates radical changes in production (and consumption!), which in turn require adequate technologies along with proper choices of materials and handling of matter/material streams. Two technological pillars for an innovation-driven, sustainable transformation have emerged: (1) the transition of the energy system from a fossil fuel based energy system to an all-renewable energy system, and (2) the transition of the matter/material resource system from a currently linear resources-to-waste system to a future circular material/matter system (i.e., Circular Economy).

In the lecture, the interaction of these two pillars along with the importance and potential role of AI, machine learning and cognitive technologies in supporting and driving the required radical, comprehensive and deep transformative changes to Sustainable Development will be explored from a meta-level perspective.

Short biography

Reinhold W. Lang is a full professor at the Johannes Kepler University Linz (A), where he heads the *Institute for Polymeric Materials and Testing (IPMT)* and presides the *Polymer Engineering & Plastics Technology* study program. As a polymer material scientist, his research focus is in the fields of *"Mechanics, Fracture and Fatigue of Plastics and Polymer Composites"*, *"Polymeric Materials for Solar Energy Technologies"*, and *"Mechanical Recycling of Plastics"*. Since the early 1990ies, he has also strongly been engaged with the broad and transdisciplinary topic *"Polymer Technologies for Sustainable Development"*.

Referring to the JKU Development Plans, as of 2017 he has been in charge of establishing and expanding the new inter-faculty JKU focus-field *"Sustainable Development: Responsible Technologies & Management* (JKU*sustain*)"*, and he is a member of the steering committee of the project *"Universities for Sustainable Development Goals (UniNEtZ)"*, in which 16 Austrian universities collaborate on the UN Agenda 2030 and the SDGs.

He is also a long-standing member of the board of *AEE - Institute for Sustainable Technologies* (*AEE INTEC*, Gleisdorf, AT) and a member of the *Advisory Committee of PlasticsEurope*, the European association of plastics manufacturers. Up to recently he was a member of the board of the *Climate Change Centre Austria (CCCA)*. On a socio-political level, he has been active as a co-initiator of *forumFUTURE*, a 'competence forum for sustainable development in politics, business and society' founded in 2019.