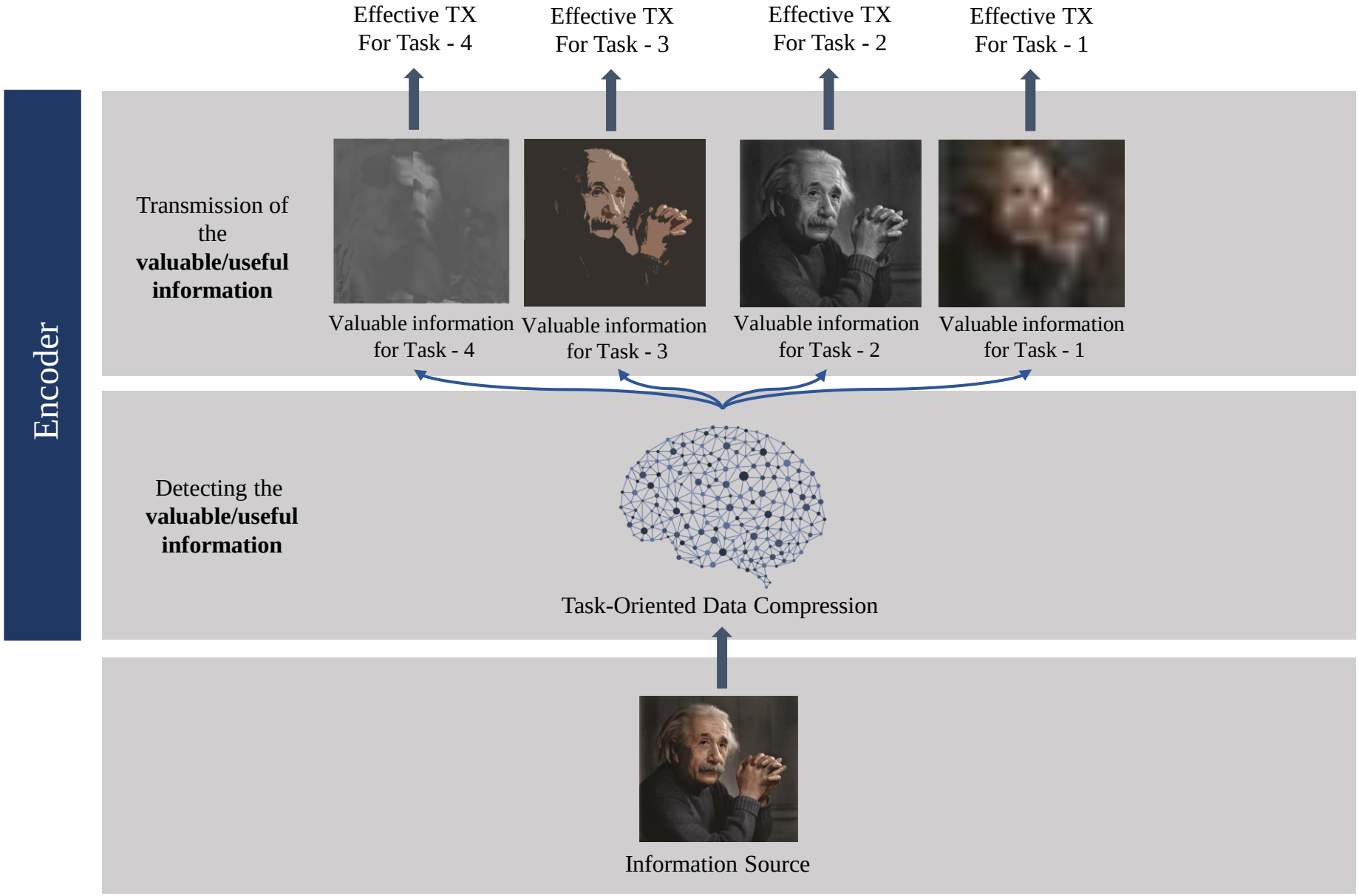

Graphical Abstract – In the era of cyber-physical systems, the effectiveness of communications is not simply determined by the bit rate, but most importantly by how informative the received communications are for the efficient completion of the task in hand. Some examples are device to device communications for remote controlling of a robot, automating a production line or collaboratively sensing through a drone swarm. To effectively complete different tasks, different parts of information source may prove valuable/useful. The aim of task-oriented data compression is to find an indirect universal approach for the extraction of the valuable information for any/(a wide range) of task(s). Knowing which part of the information source is sufficient to effectively carry out the task helps to redesign communication systems at different layers. In particular, task-oriented data compression's aim is to transmit only the valuable part of the information source.