

Adaptive Data Approximations Codec (ADAC) for AI/ML-based Cyber-Physical Systems

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Abstract : The fast growth in information technology has led to demands to access/process data. CPSs heavily depend on the time of hardware/software operations and communication over the network (i.e., real-time/parallel operations in CPSs (e.g., autonomous vehicles). Since data processing is an important means to overcome the issue confronting data management, reducing the gap between the technological-growth and the data-complexity and channel-bandwidth. An adaptive perpetual data approximation method is introduced to manage the actual entropy of the digital spectrum. An ADAC implemented as an accelerator and/or apps for servers/smart-connected devices adaptively rescales digital contents (avg.62.8%), data processing/access time/energy, encryption/decryption overheads in AI/ML applications (facial ID/recognition).

Keywords : adaptive codec, AI, ML, HPC, cyber-physical, cybersecurity

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