4th Workshop: Elaboration of Recommendations

Technology and Design of new computing paradigms

Rapporteurs:

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INPUTS FROM:

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Attendees: Victor Zhirnov (SRC)
                    Simon Thorpe (CNRS-Université Toulouse 3)
                    Sandip Tiwari (Cornell)
                    Mustafa Badaroglu (imec)
                    Alain Cappy (CNRS-LAAS)
                    Paolo Lugli (TU München)
                    Helena Theander (Chalmers)

- **Transversal coherent research project (super "IP")** aiming at integration of unconventional computing paradigms (e.g., quantum computing, neuromorphic computing, chemical/molecular computing) with digital environments via digital-analogue hardware and software interfaces, in order to create useful hybrid systems.

- **Research areas should focus on mathematical problems and/or applications that unconventional computing can solve or give an answer more efficiently** (see beating a chess masters with less resources than Deep Blue)
  For example, image recognition (characterised by complexity of image, time and energy required for it), data-mining of complex big data (combinatorial efficiency of quantum computing or associative learning of neuromorphic computing), finding repeated patterns in sequence of events (e.g., in monitoring internet activity), creating meaningful outputs from input sequences

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SEVENTH FRAMEWORK PROGRAMME

- **Research topics should focus on hardware (e.g., solid-state qubits, memristors) and software enablers for unconventional computing, aiming at integrated solutions and addressing adaptive learning by a system in relation to interaction with human users**