**Motivation**

<table>
<thead>
<tr>
<th>NON-VOLATILE MAIN MEMORY</th>
<th>RECOVERABLE COMPUTING</th>
<th>MAIN CHALLENGE</th>
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| Combines the benefits of secondary storage and DRAM:  
  - Large and inexpensive.  
  - Durable.  
  - Byte-addressable. | Durability  
  NVMM has the power to enable fast recovery. Crash Recovery model  
  System may experience a crash failure. |  
  - Data stored in CPU-registers, caches and DRAM are volatile.  
  - Persistence instructions are used to ensure durability, but they are asynchronous (e.g. pwb).  
  - Persistence instructions are expensive in terms of performance. |

**PERSIST Objectives and Methodology**

**OBJECTIVES**

1. Theoretical Underpinning of NVM computing:
   a. Develop a robust theoretical framework for NVM computing
   b. Formulate NVM consistency theory and define efficient assumptions
   c. Explore complexity measures and propose appropriate models for NVM computing.

2. Recoverable computing at low cost
   a. Design efficient recoverable algorithms, data structures, and synchronization methods
   b. Enable rapid execution recovery after failures
   c. Come up with recoverable versions of complex indexing structures for processing big data-series collections

**PERSIST Innovation & Impact**

1. The proper understanding of the functioning of current and future NVM approaches and the capability to formally assess them.

2. The harnessing of the performance challenges of NVM-based recoverable computing (i.e., computing whose state can be restored after recovery from a failure or a reset), and the better conceptualization of its performance characteristics and boundaries.

**ECONOMIC IMPACT**

1. NVM is expected to bring significant improvements on a wide spectrum of systems and applications e.g. data centers, cloud computing, Future Internet, big-data etc.

2. Exa-scale computing and the future of high-performance computing (HPC).

3. Storage systems and architectures.

4. Transaction-oriented systems.

**Contact**

Prof. Panagiota Fatourou  
University of Crete, Dept. of Computer Science & Foundation for Research and Technology- Hellas, Institute of Computer Science (ICS)  
Tel.: +30 6973 99127, Email: faturu@csd.uoc.gr

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