

InfoSymbiotics/DDDAS: From Big Data to New Capabilities / Frederica Darema (AFOSR)

In recent years there have been transformative changes in the application systems landscape in that we deal with more complex systems - often systems-of-systems, be they natural, engineered, or societal systems. In tandem is the emergence of advanced infrastructure environments for analysis, understanding and management of such systems, spanning wide and heterogeneous range of powerful computational and instrumentation infrastructures, including ubiquitous end-user devices and pervasive networks of sensing and control systems. All these drive multilevel models and multimodal data representations of such systems, computed or measured, spurring unprecedented volumes of data, termed "Big Data". The opportunity to exploit these in intelligent ways and convert them into new capabilities will be discussed in the context of the InfoSymbiotics/DDDAS (Dynamic Data Driven Applications Systems) paradigm, whereby computational and instrumentation aspects of an application system as viewed as unified, allowing discovery and use of data, essential to improve the analysis of a system.