



Seminar Series



Dr. Frederica Darema

President, CEO of InfoSymbiotic Systems Society

Frederica Darema, PhD, is President and CEO of the InfoSymbiotic Systems Society. She has retired as Senior Executive Service (SES) member and Director of the Air Force Office of Scientific Research where she led the entire basic research investment for the AF, and concurrently served as Research Director in the Air Force's Chief Data Office and Associate Deputy Assistant Secretary at the Air Force Office for Science, Technology and Engineering. Dr. Darema is a Fellow of the Institute of Electrical and Electronics Engineers (IEEE) and Fellow of the World Academy of Art and Science, among other professional recognitions. Since 2000, she has organized and led research initiatives, programs, workshops, conferences, including co-leading the biannual DDDAS/InfoSymbiotic Systems Conference series, and other forums fostering and promoting DDDAS-based science and technology advances. She serves in university Advisory Boards, in the IEEE Future Networks Technical Committee, and in governmental research review panels.

InfoSymbiotics/DDDAS for Reliable AI and Predictive Digital Twins

This presentation will address the advanced capabilities enabled through the DDDAS (Dynamic Data Driven Applications Systems) paradigm for understanding, optimized design, and operational management of complex systems (natural, engineered, or societal). DDDAS entails system-cognizant modeling, where the system-model at execution time can learn and be sped up through data dynamically incorporated into the executing model (dynamic data inputs), and in reverse the executing model controls the system-instrumentation (system sensors and controllers); thus DDDAS enables "systems-analytics" capabilities and for systems' dynamic conditions, rather than simply the "data-analytics" capabilities of the typical AI approaches (ML, DL, and NN) trained on static data. DDDAS encompasses domain knowledge and within its framework can exploit AI methods, enabling interpretability, explainability, and predictive abilities, and enhancing the traditional notion of "Digital Twins" to one of Dynamic or Predictive Digital Twins. The Talk will discuss the foundational methods and provide examples of advanced capabilities in a number of application areas.

Date:
February 17, 2025

Time:
2:00 - 3:00 pm

Location:
Blocker 220 and
Zoom

Faculty host:
Dr. Jian Tao,
Director of TAMIDS
Digital Twins Lab

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