DAY-1 – Friday, October 2, 2020

8:30-9:00 Opening Remarks– *Frederica Darema and Erik Blasch*
Session Chair – Erik Blasch
9:00-9:45 Keynote-1
Predictive digital twins: Where dynamic data-driven learning meets physics-based modeling
Karen Willcox
Session Chair – Erik Blasch
9:45 -10:45 Plenary Talks – Section 1: Digital Twins
A Dynamic Data Driven Applications Systems (DDDAS)-based Digital Twin Framework
Sarah Malik, *RakeenRouf, Krzysztof Mazur, AntoniosKontsos*
A Hardware Testbed for Dynamic Data-Driven Aerospace Digital Twins
Stefanie J. Salinger, *Michael G. Kapteyn, Cory Kays, Jacob V. R. Pretorius, Karen E. Willcox*

10:45-11:00 Break
Session Chair – Ewa Deelman
11:00-12:30 Plenary Talks – Section 2: Environment Cognizant Adaptive-Planning Systems
A DDDAS Protocol for Real-Time Large-Scale UAS Flight Coordination
David Sacharny, *Thomas C. Henderson, Ejay Guo*
Data-Driven State Awareness for Fly-by-Feel Aerial Vehicles via Adaptive Time Series and Gaussian
Process Regression Models
Shabbir Ahmed, Ahmad Amer, Carlos Varela, ***Fotis Kopsaftopoulos***
Integrated Planning, Decision-Making, and Weather Modeling for UAS Navigating Complex Weather
John J. Bird, *Katherine Glasheen, Eric W. Frew*

12:30-13:00 LunchBreak

Session Chair – Frederica Darema
13:00-13:45 Keynote-2
DDDAS for NASA's Science Mission Directorate
Michael S. Seablom
Session Chair – Frederica Darema
13:45 – 15:45 – Plenary Talks - Section 3: Energy Systems
Microgrid Operational Planning using Deviation Clustering within a DDDAS Framework
Joshua Darville *and Nurcin Celik*
Dynamic Data-Driven Self-Healing Application for Phasor Measurement Unit Networks
Yanfeng Qu, *Xin Liu, Jiaqi Yan, Dong Jin*
Interpretable Deep Attention Model for Multivariate Time Series Prediction in Building Energy System
Tryambak Gangopadhyay, *Sin Yong Tan, Zhanhong Jiang, Soumik Sarkar*
Overcoming Stealthy Adversarial Attacks on Power Grid Load Predictions through Dynamic Data Repair
Xingyu Zhou, *Robert Canady, Yi Li, Xenofon Koutsoukos, Aniruddha Gokhale*

15:45 – 16:00 Break

Session Chair – Artem Korobenko
16:00 – 17:30 Plenary Talks – Section 4: Materials Systems
Uncertainty Analysis of Self Healed Composites with Machine Learning as Part of DDDAS
Sameer B. Mulani, *Samit Roy, Bodiuzzaman Jony*
Active Search methods to Predict Material Failure under Intermittent Loading in the Serebrinsky-Ortiz
Fatigue Model
Stephen Guth *and Themistoklis Sapsis*
Dynamic Data-Driven Distribution Tracking of Nanoparticle Morphology
Chiwoo Park *and Yu Ding*

17:30 – 18:15 Break

Session Chair – Alex Aved
18:15 – 20:00Posters Session-1
Physics-based SAR Modeling and Simulation for Large-scale Data Generation of Multi-Platform Vehicles for Deep Learning-based ATR
   __Branndon Jones__, Ali Ahmadibeni, Maxine Beard, and Amir Shirkhodaie
Towards Provably Correct Probabilistic Flight Systems
   __Elkin Cruz-Camacho__, Saswata Paul, Fotis Kopsaftopoulos and Carlos A. Varela
Dynamic Data-Driven Formal Progress Envelopes for Distributed Algorithms
   __Saswata Paul__, Fotis Kopsaftopoulos, Stacy Patterson and Carlos A. Varela
Dynamic Sensor Processing for Securing Autonomous Vehicles
   Raul Quinonez, Luis Salazar, Jairo Giraldo and __Alvaro A. Cardenas__
A Scalable Mixture Model Based Defense Against Data Poisoning Attacks on Classifiers
   __Xi Li,__ David J. Miller, Zhen Xiang and George Kesidis
Resilient Machine Learning (rML) Ensemble Against Adversarial Machine Learning Attacks
   Likai Yao, CihanTunc, __Pratik Satam__ and Salim Hariri
Data-based Defense-in-Depth of Critical Systems
   __Styliani Pantopoulou__, Pola Lydia Lagari, Clive Townsend, and Lefteri H. Tsoukalas

DAY-2 Saturday, October3, 2020

8:15-8:30 2nd Day Opening Comments - Frederica Darema and Erik Blasch
Session Chair – Frederica Darema
8:30-9:45 Keynote-3:
Revisiting the Top Ten Ways that DDDAS Can Save the World – With an update in the BioInfoSciences area and on the Energy Bridge
   Sangtae Kim

9:45-10:45 Plenary Talks – Section 5: Physics-based Systems Analysis
Machine Learning Algorithms for Improved Thermospheric Density Modeling
   __Herbert Turner, Maggie Zhang__, David Gondelach, Richard Linares
Dynamic Transfer Learning from Physics-based Simulated SAR Imagery for Automatic Target Recognition
   __Ali Ahmadibeni__, Brandon Jones, Damiyelle Smith, Amir Shirkhodaie

10:45-11:00 Break
Session Chair –Panos Markopoulos
11:00 -12:30 Plenary Talks – Section 6: Imaging Methods and Systems
Uncertainty Estimation for Semantic Segmentation of Hyperspectral Imagery
   __Aneesh Rangnekar__, Emmett Ientilucci, Christopher Kanan, Matthew Hoffman
Spectral Super Resolution with DCT decomposition and Deep Residual Learning
   __Raghunath Sai Puttagunta__, Renlong Hang, Zhu Li, Shuvra Bhattacharyya, George York
Active Scene Classification via Dynamically Learning Prototypical Views
   __Zachary A. Daniels__ and Dimitris N. Metaxas

12:30-13:00 LunchBreak
Session Chair – Frederica Darema
13:00-13:45 Keynote-4:
Using Dynamic Data Driven Cyberinfrastructure for Next Generation Disaster Intelligence
   Ilkay Altintas
Session Chair– Robert Bohn
13:45 – 15:45 Plenary Talks – Section 7: Learning Systems
Information Ensemble Kalman Learning for Neural Structure
   Margaret Trautner, Gabriel Margolis, __Sai Ravela__
Reachability Analysis Based Tracking: Applications to Non-Cooperative Space Object Tracking

Zach Hall and *Puneet Singla*
Sparse Regression and Adaptive Feature Generation for the Discovery of Dynamical Systems
Chinmay S. Kulkarni, Abhinav Gupta, *Pierre F. J. Lermusiaux*
Improving Prediction Confidence in Learning-Enabled Autonomous Systems
Dimitrios Boursinos and *Xenofon Koutsoukos*

15:45 16:00 Break
Session Chair/Moderator – Sai Ravela
16:00 – 17:30 IndustryPanel -1: Impact of DDDAS/InfoSymbiotics in the Industrial Sector
Panelists: Daniel Abramovitch, Agilent Technologies; Sandeep Gogineni, Information Systems Laboratories; Cory Kays, Cornerstone Research; Chung-Sheng Li, PriceWaterhouseCooper; Jose Moreira, IBM; Chitra Sivanandam, SAIC; Nurali Virani, GE

17:30 – 18:15 Break
Session Chair –Luda Werbos
18:15 – 20:00Posters Session-2
Physics-Driven Machine Learning for Time-Optimal Path Planning in Stochastic Dynamic Flows
*Rohit Chowdhury*and *Deepak Subramani*
Discovering Laws from Observations: A Data-driven Approach
Chenzhong Yin, *Gaurav Gupta and Paul Bogdan*
An On-demand Weather Avoidance System for Small Aircraft Flight Path Routing
Eric Lyons, *David Westbrook, Andrew Grote, George Papadimitriou, Komal Thareja, Cong Wang, Michael Zink, Ewa Deelman, Anirban Mandal, and Paul Ruth*
Dynamic, Data-Driven Hyperspectral Image Classification on Resource-Constrained Platforms
Lei Pan, *Rijun Liao, Zhu Li and Shuvra S. Bhattacharyya*
Semi-Supervised Visual Tracking Based on Variational Siamese Network
Liang Xu and *Ruixin Niu*
Occlusion Detection for Dynamic Adaptation
Zachary Mulhollan, *Aneesh Rangnekar, Anthony Vodacek and Matthew J. Hoffman*
PNEUMON: A DDDAS Framework to Detect Fatigue and Dyspnea in COPD
Varun Kanal, *Andrew Miller, Diego Vester, Jackson Liller, Maria Kyrarini, Glenn Wylie, Michael J. Falvo, and Fillia Makedon*

DAY-3 -- Sunday, October4, 2020
8:15-8:30 2nd Day Opening Comments – Frederica Darema and Erik Blasch

Session Chair/Moderator – Kishore Reddy
8:30-10:00 IndustryPanel-2:AI/ML Applications for Aerospace and Defense
Panelists: Kishore K. Reddy, Raytheon; Amit Surana, Raytheon; Paul Kodzwa, Raytheon; Shane Zable, Raytheon; Richard LaRowe, Raytheon; Eric Brewer, Collins Aerospace; and Steven Burd, Pratt and Whitney

Session Chair – Erik Blasch
10:00 – 10:45 Keynote #5 Intelligent Contingency Management for Urban Mobility
Irene Gregory

10:45-11:00 Break
Session Chair/Moderator – Newton Campbell
11:00 -12:30Federal Agencies Panel:
Future Direction of DDDAS/InfoSymbiotics and Collaborations with Related Initiatives
Panelists: Erik Blasch, AFOSR; Robert Bohn, NIST; Jahla Gato, Australian Space Agency; Edward McLarney, NASA/Langley; Jasmine Ratchford, DHS; Sonia Sachs, DoE

12:30– 12:45 Closing Remarks - Frederica Darema and Erik Blasch