

# 2022 Dynamical Systems and Control Theory Program Review

Dr. Fred Leve | August 8-11, 2022 | Niceville, FL -hybrid

Doolittle Institute  
1140 E. John Sims Pkwy, #1, Niceville, FL 32578

## Agenda Day 1 | Monday, August 8, 2022 CDT (Central Daylight Time)

Time	Topic	Presenter
8:00-8:30	Registration / Login	
8:30-8:40	Welcome	AFOSR Leadership
8:40-8:50	Status Update	Frederick Leve, AFOSR
<b>Technical Talks</b>		
8:50-9:20	Rough Euler-Poincaré equations and their calibration	James Michael Leahy, Imperial College London
9:20-9:50	Defense Differential Games and Leader-Follower Ring Formation	Eloy Garcia, AFRL/RQ
9:50-10:20	Many-on-One Pursuit-Evasion	Meir Pachter, AFIT
10:20-10:40	<b>COFFEE BREAK (Lobby ONLY)</b>	
10:40-11:10	Stochastic Control and Differential Games for Systems with non-Gaussian Noise	Tyrone Duncan & Bozenna Pasik-Duncan, KU
11:10-11:40	Safe-by-design planner-tracker synthesis with a hierarchy of system models	Murat Arcak, UC Berkeley
11:40-12:10	Population Games: New Methods And Applications	Nuno Martins, Umaryland
12:10-1:40	<b>LUNCH (Outside Doolittle)</b>	
1:40-2:10	Inverse Optimal Safe Control	Miroslav Krstic, UCSD
2:10-2:40	Reaching a Consensus with Reduced Information	Steve Morse, Yale
2:40-3:10	Model-free Parameter Estimation	Eckhardt, Daniel, AFRL/RQ
3:10-3:30	<b>COFFEE BREAK (Lobby ONLY)</b>	
3:30-4:00	Optimal Linear-Time Algorithms in Allocation Problems	Jason Marden, UCSB
4:00-4:30	Achieving global objectives through local control with unknown system dynamics	Vijay Gupta, Notre Dame
<b>MEETING ADJOURN</b>		

Agenda Day 2   Tuesday, August 9, 2022 CDT (Central Daylight Time)		
Time	Topic	Presenter
8:00-8:30	Registration / Login	
8:30-8:40	Morning Welcome and Discussions	Frederick Leve, AFOSR
Technical Talks		
8:40-9:10	Embedded Graphon Mean Field Games	Peter Caines, McGill U
9:10-9:40	Mutational Control Systems on Metric Spaces	Helene Frankowska, CNRS U Paris
9:40-10:10	Autonomous guidance and targeting by semi-algebraic methods: From local to global shooting	Georgy Scholten, U Sorbonne
10:10-10:30	COFFEE BREAK (Lobby ONLY)	
10:30-11:00	Control of ill-posed fractional diffusion equations	Mahamadi Warma, GMU
11:00-11:30	Lyapunov-Like Functions for Almost Global Convergence in Discrete-Time Systems	Dennis Bernstein, and Jessie Hoagge, Umich and Ukentucky
11:30-12:00	Optimal Control, Inverse Optimality, Dissipativity, and Stability Margins for Nonlinear Discrete-Time Stochastic Regulators	Wassim Haddad, GaTech
12:00-1:30	LUNCH (Outside Doolittle)	
1:30-2:00	Learning-based Planning and Control with Persistent Safety for UAS	Naira Hovakimyan, UIUC
2:00-2:30	Developments in Suboptimal Model Predictive and Constrained Control	Ilya Kolmanvsky, U Mich
2:30-3:00	Uncertainty Propagation for Stochastic Hybrid System on a Lie Group	Taeyoung Lee and Melvin Leok, GWU and UCSD
3:00-3:20	COFFEE BREAK (Lobby ONLY)	
3:20-3:50	Black-box data-driven modeling via occupation kernels	Rushi Kamalapurkar and Joel Rosenfeld, USF and Uoklahoma
3:50-4:20	Convergence Guarantees for DMD with Kernel Methods	Joel Rosenfeld, USF
4:20	MEETING ADJOURN	

Agenda Day 3   Wednesday, August 10, 2022 CDT (Central Daylight Time)		
Time	Topic	Presenter
8:00-8:30	Registration / Login	
8:30-8:40	Morning Welcome and Discussions	Frederick Leve, AFOSR
Technical Talks		
8:40-9:10	Inferring entropy production rate from partially observed Langevin dynamics under coarse-graining	Gili Bisker, Tel Aviv University
9:10-9:40	Model-Based Machine Learning Methods for Optimal Feedback Control	Qi Gong, UCSC
9:40-10:10	Chance-Constrained Stochastic Optimal Control and Numerical Methods to HJB PDEs with Dirichlet Boundary Conditions	Tanaka Takashi, UT Austin
10:10-10:30	COFFEE BREAK (Lobby ONLY)	
10:30-11:00	Convexification of Motion Planning through Liftings and Hypercomplex Numbers	Mehran Mesbahi, U of Washington
11:00-11:30	Design of robust and accurate biosensing systems	Domitilla Del Vecchio, MIT
11:30-12:00	Network motifs and responses of nonlinear systems	Eduardo Sontag, Northeastern U
12:00-1:30	LUNCH (Outside Doolittle)	
1:30-2:00	Functional and Distributional Control of Ensemble Systems	Jrshin Li, Wash U
2:00-2:30	Controllability Issues of Linear Ensemble Systems	Xudong Chen, CU Boulder
2:30-3:00	Finite-Section Approximations of Carleman Linearization and Its Exponential Convergence	Nader Motee, Lehigh U
3:00-3:20	COFFEE BREAK (Lobby ONLY)	
3:20-3:50	Contraction Theory for Network Systems	Francesco Bullo, UCSB
3:50-4:20	Stochastic hybrid systems: from robust decision-making networks to distributed command for suppression of persistent adversaries	Andy Teel, UCSB
4:20-4:50	Dynamic feedback stabilization and fibre bundles	Mohamed Belabbas, UIUC
4:50	MEETING ADJOURN	

Agenda Day 4   Thursday, August 11, 2022 CDT (Central Daylight Time)		
Time	Topic	Presenter
8:00-8:30	Registration / Login	
8:30-8:40	Morning Welcome and Discussions	Frederick Leve, AFOSR
Technical Talks		
8:40-9:10	Topological encoding of graph representations of time series	Firas Khasawneh and Elizabeth Munch, Michigan State U
9:10-9:40	Linear Quadratic Gaussian Synthesis for a Heated/Cooled Rod Using Point Actuation and Point Sensing	Art Krener, UC Davis
9:40-10:10	Data-guided Learning and Control of Higher Order Structures	Indika Rajapakse, et al U Mich and UTRC
10:10-10:30	COFFEE BREAK (Lobby ONLY)	
10:30-11:00	Target Tracking Subject to Intermittent Measurements using Attention Deep Neural Networks	Zachary Bell, AFRL/RW
11:00-11:30	Analysis of Non-convex Optimization Using Control Theory	Javad Lavaei, UC Berkeley
11:30-12:00	Is Poly the true language of computation?	David Spivak, Topos Institute
12:00-1:30	LUNCH (Outside Doolittle)	
1:30-2:00	Systematic Tools to Satisfy Temporal Logic Specifications in Hybrid Dynamical Systems	Ricardo Sanfelice, UCSC
2:00-2:30	Cislunar Catalog Maintenance and Characterization	Aaron Rosengren, UCSD
2:30-3:00	Hybrid Dynamics for Efficient Learning in Network Games: Momentum, Coordination, and Stability	Jorge Poveda, CU Boulder
3:00-3:30	Entropy in Biology and Other Subjects of Interest	Allen Tannenbaum, Stonybrook U
3:30-4:00	Runtime Assurance for Safety-Critical Systems from Fast, In-the-Loop Reachability	Sam Coogan, GaTech
4:00-4:30	Closing Remarks	Frederick Leve, AFOSR
4:30	MEETING ADJOURN	