Igor Mezic

List of Publications by Year in Descending Order

164 papers	9,115 citations	37 h-index	94 g-index
174 ext. papers	10,985 ext. citations	4.7 avg, IF	6.78 L-index

#	Paper	IF	Citations
164	On Numerical Approximations of the Koopman Operator. *Mathematics*, **2022**, 10, 1180	2.3	0
163	Koopman Resolvent: A Laplace-Domain Analysis of Nonlinear Autonomous Dynamical Systems. *SIAM Journal on Applied Dynamical Systems*, **2021**, 20, 2013-2036	2.8	3
162	Control-Oriented, Data-Driven Models of Thermal Dynamics. *Energies*, **2021**, 14, 1453	3.1	1
161	On the Approximation of Koopman Spectra of Measure-Preserving Flows. *SIAM Journal on Applied Dynamical Systems*, **2021**, 20, 232-261	2.8	
160	Convex Computation of Extremal Invariant Measures of Nonlinear Dynamical Systems and Markov Processes. *Journal of Nonlinear Science*, **2021**, 31, 1	2.8	3
159	Unsteady dynamics in the streamwise-oscillating cylinder wake for forcing frequencies below lock-on. *Physical Review Fluids*, **2021**, 6,	2.8	2
158	Identification of Nonlinear Systems Using the Infinitesimal Generator of the Koopman SemigroupA Numerical Implementation of the MauroyGoncalves Method. *Mathematics*, **2021**, 9, 2075	2.3	
157	Koopman mode analysis on thermal data for building energy assessment. *Advances in Building Energy Research*, **2020**, 1-15	1.8	2
156	Optimal Construction of Koopman Eigenfunctions for Prediction and Control. *IEEE Transactions on Automatic Control*, **2020**, 65, 5114-5129	5.9	21
155	Electrokinetic mixing in electrode-embedded multiwell plates to improve the diffusion limited kinetics of biosensing platforms. *Analytica Chimica Acta*, **2020**, 1106, 79-87	6.6	2
154	Koopman Spectrum and Stability of Cascaded Dynamical Systems. *Lecture Notes in Control and Information Sciences*, **2020**, 99-129	0.5	0
153	Application of Koopman-Based Control in Ultrahigh-Precision Positioning. *Lecture Notes in Control and Information Sciences*, **2020**, 451-479	0.5	0
152	Invariant Sets in Quasiperiodically Forced Dynamical Systems. *SIAM Journal on Applied Dynamical Systems*, **2020**, 19, 329-351	2.8	1
151	On Least Squares Problems with Certain Vandermonde--Khatri--Rao Structure with Applications to DMD. *SIAM Journal of Scientific Computing*, **2020**, 42, A3250-A3284	2.6	1
150	Koopman Framework for Global Stability Analysis. *Lecture Notes in Control and Information Sciences*, **2020**, 35-58	0.5	
149	Introduction to the Koopman Operator in Dynamical Systems and Control Theory. *Lecture Notes in Control and Information Sciences*, **2020**, 3-33	0.5	2
148	Koopman Model Predictive Control of Nonlinear Dynamical Systems. *Lecture Notes in Control and Information Sciences*, **2020**, 235-255	0.5	2

147	Spectrum of the Koopman Operator, Spectral Expansions in Functional Spaces, and State-Space Geometry. *Journal of Nonlinear Science*, **2020**, 30, 2091-2145	2.8	34
146	Spectral analysis of the Koopman operator for partial differential equations. *Chaos*, **2020**, 30, 113131	3.3	7
145	Search strategy in a complex and dynamic environment: the MH370 case. *Scientific Reports*, **2020**, 10, 19640	4.9	3
144	Extended Dynamic Mode Decomposition with Learned Koopman Eigenfunctions for Prediction and Control **2020**,		4
143	Exponentially decaying modes and long-term prediction of sea ice concentration using Koopman mode decomposition. *Scientific Reports*, **2020**, 10, 16313	4.9	5
142	Data-driven spectral analysis of the Koopman operator. *Applied and Computational Harmonic Analysis*, **2020**, 48, 599-629	3.1	35
141	Koopman Operator Spectrum for Random Dynamical Systems. *Journal of Nonlinear Science*, **2020**, 30, 2007-2056	2.8	11
140	Spectral Complexity of Directed Graphs and Application to Structural Decomposition. *Complexity*, **2019**, 2019, 1-18	1.6	6
139	Small-world networks and synchronisation in an agent-based model of civil violence. *Global Crime*, **2019**, 20, 161-195	1.4	3
138	Data Driven Koopman Spectral Analysis in Vandermonde--Cauchy Form via the DFT: Numerical Method and Theoretical Insights. *SIAM Journal of Scientific Computing*, **2019**, 41, A3118-A3151	2.6	6
137	Koopman Mode Analysis of agent-based models of logistics processes. *PLoS ONE*, **2019**, 14, e0222023	3.7	3
136	On the Approximation of Koopman Spectra for Measure Preserving Transformations. *SIAM Journal on Applied Dynamical Systems*, **2019**, 18, 1454-1497	2.8	8
135	On learning Hamiltonian systems from data. *Chaos*, **2019**, 29, 121107	3.3	26
134	Electrokinetic Mixing for Improving the Kinetics of an HbA1c Immunoassay. *Scientific Reports*, **2019**, 9, 19885	4.9	4
133	PrandtlBatchelor theorem for flows with quasiperiodic time dependence. *Journal of Fluid Mechanics*, **2019**, 862,	3.7	2
132	On Convergence of Extended Dynamic Mode Decomposition to the Koopman Operator. *Journal of Nonlinear Science*, **2018**, 28, 687-710	2.8	103
131	The Translational Value of Psychophysiology Methods and Mechanisms: Multilevel, Dynamic, Personalized. *Journal of Studies on Alcohol and Drugs*, **2018**, 79, 229-238	1.9	16
130	Linear predictors for nonlinear dynamical systems: Koopman operator meets model predictive control. *Automatica*, **2018**, 93, 149-160	5.7	183

129	Multiscale modeling of in-room temperature distribution with human occupancy data: a practical case study. *Journal of Building Performance Simulation*, **2018**, 11, 145-163	2.8	4
128	Data Driven Modal Decompositions: Analysis and Enhancements. *SIAM Journal of Scientific Computing*, **2018**, 40, A2253-A2285	2.6	20
127	A Data-Driven Koopman Model Predictive Control Framework for Nonlinear Partial Differential Equations **2018**,		19
126	Power grid transient stabilization using Koopman model predictive control. *IFAC-PapersOnLine*, **2018**, 51, 297-302	0.7	20
125	An agent-based model of urban insurgence: Effect of gathering sites and Koopman mode analysis. *PLoS ONE*, **2018**, 13, e0205259	3.7	7
124	Koopman Operator Family Spectrum for Nonautonomous Systems. *SIAM Journal on Applied Dynamical Systems*, **2018**, 17, 2478-2515	2.8	9
123	Ergodicity-Based Cooperative Multiagent Area Coverage via a Potential Field. *IEEE Transactions on Cybernetics*, **2017**, 47, 1983-1993	10.2	20
122	Quasi-periodic intermittency in oscillating cylinder flow. *Journal of Fluid Mechanics*, **2017**, 828, 680-707	3.7	9
121	Ergodic Theory, Dynamic Mode Decomposition, and Computation of Spectral Properties of the Koopman Operator. *SIAM Journal on Applied Dynamical Systems*, **2017**, 16, 2096-2126	2.8	147
120	Frontiers of chaotic advection. *Reviews of Modern Physics*, **2017**, 89,	40.5	106
119	Study of dynamics in post-transient flows using Koopman mode decomposition. *Physical Review Fluids*, **2017**, 2,	2.8	36
118	Applied Koopman operator theory for power systems technology. *Nonlinear Theory and Its Applications IEICE*, **2016**, 7, 430-459	0.6	45
117	Programmable Potentials: Approximate N-body potentials from coarse-level logic. *Scientific Reports* , **2016**, 6, 33415	4.9	
116	Global Stability Analysis Using the Eigenfunctions of the Koopman Operator. *IEEE Transactions on Automatic Control*, **2016**, 61, 3356-3369	5.9	104
115	Correspondence between Koopman mode decomposition, resolvent mode decomposition, and invariant solutions of the Navier-Stokes equations. *Physical Review Fluids*, **2016**, 1,	2.8	51
114	Mesochronic classification of trajectories in incompressible 3D vector fields over finite times. *Discrete and Continuous Dynamical Systems - Series S*, **2016**, 9, 923-958	2.8	6
113	Mini-Workshop: Applied Koopmanism. *Oberwolfach Reports*, **2016**, 13, 297-340	0	
112	Uniformization, organization, association and use of metadata from multiple content providers and manufacturers: A close look at the Building Automation System (BAS) sector **2016**,		2

111	Pattern recognition and classification of HVAC rule-based faults in commercial buildings **2016**,		3
110	An operator-theoretic viewpoint to non-smooth dynamical systems: Koopman analysis of a hybrid pendulum **2016**,		4
109	On Comparison of Dynamics of Dissipative and Finite-Time Systems Using Koopman Operator Methods**The funding provided by ARO Grant W911NF-11-1-0511.. *IFAC-PapersOnLine*, **2016**, 49, 454-461	0.7	2
108	Koopman Mode Decomposition for Periodic/Quasi-periodic Time Dependence. *IFAC-PapersOnLine*, **2016**, 49, 690-697	0.7	8
107	On Koopman and dynamic mode decompositions for application to dynamic data with low spatial dimension **2016**,		6
106	Data fusion via intrinsic dynamic variables: An application of data-driven Koopman spectral analysis. *Europhysics Letters*, **2015**, 109, 40007	1.6	29
105	Searching for Targets of Nonuniform Size Using Mixing Transformations: Constructive Upper Bounds and Limit Laws. *Journal of Nonlinear Science*, **2015**, 25, 741-777	2.8	1
104	Building energy modeling: A systematic approach to zoning and model reduction using Koopman Mode Analysis. *Energy and Buildings*, **2015**, 86, 794-802	7	39
103	Ergodic theory and visualization. II. Fourier mesochronic plots visualize (quasi)periodic sets. *Chaos*, **2015**, 25, 053105	3.3	8
102	A Unified Definition of Collective Instabilities in Coupled Generator Networks**During part of the work on this proceeding, Y.S. was at Department of Mechanical Engineering, University of California, Santa Barbara, supported by JSPS Postdoctoral Fellowships for Research Abroad.. *IFAC-PapersOnLine*, **2015**, 48, 89-94	0.7	
101	A prony approximation of Koopman Mode Decomposition **2015**,		36
100	On applications of the spectral theory of the Koopman operator in dynamical systems and control theory **2015**,		10
99	Nonlinear Koopman Modes and Power System Stability Assessment Without Models. *IEEE Transactions on Power Systems*, **2014**, 29, 899-907	7	70
98	A computational physiology approach to personalized treatment models: the beneficial effects of slow breathing on the human cardiovascular system. *American Journal of Physiology - Heart and Circulatory Physiology*, **2014**, 307, H1073-91	5.2	15
97	Global Isochrons and Phase Sensitivity of Bursting Neurons. *SIAM Journal on Applied Dynamical Systems*, **2014**, 13, 306-338	2.8	18
96	Global sensitivity/uncertainty analysis for agent-based models. *Reliability Engineering and System Safety*, **2013**, 118, 8-17	6.3	26
95	Minimum time heading control of underpowered vehicles in time-varying ocean currents. *Ocean Engineering*, **2013**, 66, 12-31	3.9	17
94	Performance Study of an Adaptive Controller in the Presence of Uncertainty. *IEEE Transactions on Control Systems Technology*, **2013**, 21, 1039-1043	4.8	1

93	Analysis of Fluid Flows via Spectral Properties of the Koopman Operator. *Annual Review of Fluid Mechanics*, **2013**, 45, 357-378	22	426
92	Spatial filter averaging approach of probabilistic method to linear second-order partial differential equations of the parabolic type. *Journal of Computational Physics*, **2013**, 233, 175-191	4.1	2
91	Linearization in the large of nonlinear systems and Koopman operator spectrum. *Physica D: Nonlinear Phenomena*, **2013**, 242, 42-53	3.3	93
90	A spectral operator-theoretic framework for global stability **2013**,		24
89	A methodology for meta-model based optimization in building energy models. *Energy and Buildings* , **2012**, 47, 292-301	7	175
88	Existence of invariant tori in three dimensional maps with degeneracy. *Physica D: Nonlinear Phenomena*, **2012**, 241, 1136-1145	3.3	8
87	Nonlinear Koopman Modes and a Precursor to Power System Swing Instabilities. *IEEE Transactions on Power Systems*, **2012**, 27, 1182-1191	7	52
86	Applied Koopmanism. *Chaos*, **2012**, 22, 047510	3.3	299
85	Geometry of the ergodic quotient reveals coherent structures in flows. *Physica D: Nonlinear Phenomena*, **2012**, 241, 1255-1269	3.3	73
84	Coherent Swing Instability of Interconnected Power Grids and a Mechanism of Cascading Failure **2012**, 185-202		4
83	Model reduction for agent-based social simulation: coarse-graining a civil violence model. *Physical Review E*, **2012**, 85, 066106	2.4	12
82	Uncertainty and sensitivity decomposition of building energy models. *Journal of Building Performance Simulation*, **2012**, 5, 171-184	2.8	106
81	Dynamic autoinoculation and the microbial ecology of a deep water hydrocarbon irruption. *Proceedings of the National Academy of Sciences of the United States of America*, **2012**, 109, 20286-91	11.5	133
80	Uncertainty in the energy dynamics of commercial office buildings **2012**,		1
79	Nonlinear Dynamics of Crime and Violence in Urban Settings. *Jasss*, **2012**, 15,	4.8	27
78	Extracting Dynamic Information From Whole-Building Energy Models **2012**,		3
77	Nonlinear Koopman Modes and Coherency Identification of Coupled Swing Dynamics. *IEEE Transactions on Power Systems*, **2011**, 26, 1894-1904	7	104
76	Correction to Nonlinear Koopman Modes and Coherency Identification of Coupled Swing Dynamics [Nov 11 1894-1904]. *IEEE Transactions on Power Systems*, **2011**, 26, 2584-2584	7	3

75	Multiscale Adaptive Search. *IEEE Transactions on Systems, Man, and Cybernetics*, **2011**, 41, 1076-87		14
74	The redistribution of power: neurocardiac signaling, alcohol and gender. *PLoS ONE*, **2011**, 6, e28281	3.7	18
73	Coherent Swing Instability of Power Grids. *Journal of Nonlinear Science*, **2011**, 21, 403-439	2.8	56
72	On the architecture of cell regulation networks. *BMC Systems Biology*, **2011**, 5, 37	3.5	5
71	Scalable approach to uncertainty quantification and robust design of interconnected dynamical systems. *Annual Reviews in Control*, **2011**, 35, 77-98	10.3	7
70	Metrics for ergodicity and design of ergodic dynamics for multi-agent systems. *Physica D: Nonlinear Phenomena*, **2011**, 240, 432-442	3.3	69
69	Coherent Swing Instability of power systems and cascading failures **2010**,		1
68	Uniform coverage control of mobile sensor networks for dynamic target detection **2010**,		8
67	Minimum time feedback control of autonomous underwater vehicles **2010**,		14
66	Targeted activation in deterministic and stochastic systems. *Physical Review E*, **2010**, 81, 026603	2.4	9
65	Ergodic theory and visualization. I. Mesochronic plots for visualization of ergodic partition and invariant sets. *Chaos*, **2010**, 20, 033114	3.3	42
64	A new mixing diagnostic and Gulf oil spill movement. *Science*, **2010**, 330, 486-9	33.3	132
63	Nonlinear Koopman modes of coupled swing dynamics and coherency identification **2010**,		9
62	Reduced-order models for flow control: balanced models and Koopman modes. *IUTAM Symposium on Cellular, Molecular and Tissue Mechanics*, **2010**, 43-50	0.3	13
61	An approximate parametrization of the ergodic partition using time averaged observables **2009**,		3
60	Global swing instability in the New England power grid model **2009**,		7
59	Spectral Multiscale Coverage: A uniform coverage algorithm for mobile sensor networks **2009**,		18
58	Spectral analysis of nonlinear flows. *Journal of Fluid Mechanics*, **2009**, 641, 115-127	3.7	1064

57	Coupled oscillator models with no scale separation. *Physica D: Nonlinear Phenomena*, **2009**, 238, 490-501	3.3	20
56	New pathway for self-assembly and emergent properties. *Nano Today*, **2009**, 4, 116-124	17.9	10
55	Capturing deviation from ergodicity at different scales. *Physica D: Nonlinear Phenomena*, **2009**, 238, 1668-1679	3.3	15
54	Ergodic partition of phase space in continuous dynamical systems **2009**,		6
53	Lectures on Mixing and Dynamical Systems. *CISM International Centre for Mechanical Sciences, Courses and Lectures*, **2009**, 35-108	0.6	1
52	Global swing instability of multimachine power systems **2008**,		12
51	Passive Control of Limit Cycle Oscillations in a Thermoacoustic System Using Asymmetry. *Journal of Applied Mechanics, Transactions ASME*, **2008**, 75,	2.7	6
50	Actuation requirements in high dimensional oscillator systems **2008**,		4
49	Uncertainty propagation in dynamical systems. *Automatica*, **2008**, 44, 3003-3013	5.7	15
48	An ultrashort mixing length micromixer: the shear superposition micromixer. *Lab on A Chip*, **2007**, 7, 396-8	7.2	42
47	Optimal control of mixing in Stokes fluid flows. *Journal of Fluid Mechanics*, **2007**, 580, 261-281	3.7	75
46	A mechanism for energy transfer leading to conformation change in networked nonlinear systems **2007**,		6
45	MEZIC ET AL. RESPOND. *American Journal of Public Health*, **2007**, 97, 781-782	5.1	0
44	On the dynamics of molecular conformation. *Proceedings of the National Academy of Sciences of the United States of America*, **2006**, 103, 7542-7	11.5	33
43	Agent-based modeling of drinking behavior: a preliminary model and potential applications to theory and practice. *American Journal of Public Health*, **2006**, 96, 2055-60	5.1	85
42	AC Electrokinetic Stirring and Focusing of Nanoparticles **2006**, 243-255		
41	Vortex-based Control Algorithms. *Lecture Notes in Control and Information Sciences*, **2006**, 189-212	0.5	4
40	Controlled Separation and Trapping of Particles Using Two-frequency DEP **2005**, 543		

39	A multiscale measure for mixing. *Physica D: Nonlinear Phenomena*, **2005**, 211, 23-46	3.3	128
38	Spectral Properties of Dynamical Systems, Model Reduction and Decompositions. *Nonlinear Dynamics*, **2005**, 41, 309-325	5	529
37	Control of particles in microelectrode devices. *Physical Review Letters*, **2005**, 95, 236002	7.4	26
36	Capture into resonance: a method for efficient control. *Physical Review Letters*, **2004**, 93, 084301	7.4	16
35	Mixing in the shear superposition micromixer: three-dimensional analysis. *Philosophical Transactions Series A, Mathematical, Physical, and Engineering Sciences*, **2004**, 362, 1001-18	3	84
34	Implications of Systems Dynamic Models and Control Theory for Environmental Approaches to the Prevention of Alcohol- and Other Drug Use-Related Problems. *Substance Use and Misuse*, **2004**, 39, 1713-1750	2.2	23
33	Optimal mixing in recirculation zones. *Physics of Fluids*, **2004**, 16, 867-888	4.4	38
32	Controllability for a class of area-preserving twist maps. *Physica D: Nonlinear Phenomena*, **2004**, 189, 234-246	3.3	6
31	Optimal control of a co-rotating vortex pair: averaging and impulsive control. *Physica D: Nonlinear Phenomena*, **2004**, 192, 63-82	3.3	12
30	Comparison of systems with complex behavior. *Physica D: Nonlinear Phenomena*, **2004**, 197, 101-133	3.3	201
29	Transverse momentum micromixer optimization with evolution strategies. *Computers and Fluids*, **2004**, 33, 521-531	2.8	19
28	High Efficiency Mixing in the Shear Superposition Micromixer **2004**, 499		
27	Titanium Bulk Micromachining for BioMEMS Applications: A DEP Device as a Demonstration **2004**,		2
26	Implications of systems dynamic models and control theory for environmental approaches to the prevention of alcohol- and other drug use-related problems **2004**, 39, 1713-50		4
25	Numerical Simulation of an Electroosmotic Micromixer **2003**, 653		10
24	Hybrid dynamics of two coupled oscillators that can impact a fixed stop. *International Journal of Non-Linear Mechanics*, **2003**, 38, 677-689	2.8	12
23	Weak finite-time Melnikov theory and 3D viscous perturbations of Euler flows. *Physica D: Nonlinear Phenomena*, **2003**, 176, 82-106	3.3	15
22	Uniform resonant chaotic mixing in fluid flows. *Nature*, **2003**, 425, 376-80	50.4	105

21	Spillover Stabilization in Finite-Dimensional Control and Observer Design for Dissipative Evolution Equations. *SIAM Journal on Control and Optimization*, **2003**, 42, 746-768	1.9	60
20	Controllability, integrability and ergodicity **2003**, 213-229		3
19	Statistical properties of controlled fluid flows with applications to control of mixing. *Systems and Control Letters*, **2002**, 45, 249-256	2.4	6
18	An extension of Prandtl-Batchelor theory and consequences for chaotic advection. *Physics of Fluids* , **2002**, 14, L61-L64	4.4	4
17	Non-equilibrium statistical mechanics for a vortex gas. *Journal of Turbulence*, **2002**, 3, N52	2.1	8
16	Ergodic theory and experimental visualization of invariant sets in chaotically advected flows. *Physics of Fluids*, **2002**, 14, 2235	4.4	21
15	Control of a vortex pair using a weak external flow. *Journal of Turbulence*, **2002**, 3, N51	2.1	11
14	Chaotic mixer for microchannels. *Science*, **2002**, 295, 647-51	33.3	2471
13	Break-up of invariant surfaces in action-angle-angle maps and flows. *Physica D: Nonlinear Phenomena*, **2001**, 154, 51-67	3.3	37
12	Chaotic advection in bounded Navier-Stokes flows. *Journal of Fluid Mechanics*, **2001**, 431, 347-370	3.7	28
11	Residence-time distributions for chaotic flows in pipes. *Chaos*, **1999**, 9, 173-182	3.3	17
10	Melnikov-Based Dynamical Analysis of Microcantilevers in Scanning Probe Microscopy. *Nonlinear Dynamics*, **1999**, 20, 197-220	5	92
9	A Backstepping Controller for a Nonlinear Partial Differential Equation Model of Compression System Instabilities. *SIAM Journal on Control and Optimization*, **1999**, 37, 1503-1537	1.9	15
8	Dynamical analysis and control of microcantilevers. *Automatica*, **1999**, 35, 1663-1670	5.7	146
7	A method for visualization of invariant sets of dynamical systems based on the ergodic partition. *Chaos*, **1999**, 9, 213-218	3.3	100
6	Regular and chaotic particle motion near a helical vortex filament. *Physica D: Nonlinear Phenomena*, **1998**, 111, 179-201	3.3	15
5	Patchiness: A New Diagnostic for Lagrangian Trajectory Analysis in Time-Dependent Fluid Flows. *International Journal of Bifurcation and Chaos in Applied Sciences and Engineering*, **1998**, 08, 1053-1093	2	36
4	FKG inequalities in cellular automata and coupled map lattices. *Physica D: Nonlinear Phenomena*, **1997**, 103, 491-504	3.3	5

List of Publications

3	Maximal Effective Diffusivity for Time-Periodic Incompressible Fluid Flows. *SIAM Journal on Applied Mathematics*, **1996**, 56, 40-56	1.8	20
2	Nonergodicity, accelerator modes, and asymptotic quadratic-in-time diffusion in a class of volume-preserving maps. *Physical Review E*, **1995**, 52, 3215-3217	2.4	3
1	On the dynamical origin of asymptotic t2 dispersion of a nondiffusive tracer in incompressible laminar flows. *Physics of Fluids*, **1994**, 6, 2227-2229	4.4	22