Richard D Braatz

List of Publications by Citations

434 papers	15,326 citations	64 h-index	110 g-index
499 ext. papers	18,282 ext. citations	4.3 avg, IF	6.97 L-index

#	Paper	IF	Citations
434	Fault Detection and Diagnosis in Industrial Systems **2001**,		691
433	Data-driven prediction of battery cycle life before capacity degradation. *Nature Energy*, **2019**, 4, 383-391	62.3	498
432	Modeling and Simulation of Lithium-Ion Batteries from a Systems Engineering Perspective. *Journal of the Electrochemical Society*, **2012**, 159, R31-R45	3.9	436
431	Fault diagnosis in chemical processes using Fisher discriminant analysis, discriminant partial least squares, and principal component analysis. *Chemometrics and Intelligent Laboratory Systems*, **2000**, 50, 243-252	3.8	432
430	End-to-end continuous manufacturing of pharmaceuticals: integrated synthesis, purification, and final dosage formation. *Angewandte Chemie - International Edition*, **2013**, 52, 12359-63	16.4	426
429	A tutorial on linear and bilinear matrix inequalities. *Journal of Process Control*, **2000**, 10, 363-385	3.9	367
428	Fault detection in industrial processes using canonical variate analysis and dynamic principal component analysis. *Chemometrics and Intelligent Laboratory Systems*, **2000**, 51, 81-93	3.8	347
427	Assessment of Recent Process Analytical Technology (PAT) Trends: A Multiauthor Review. *Organic Process Research and Development*, **2015**, 19, 3-62	3.9	251
426	First-principles and direct design approaches for the control of pharmaceutical crystallization. *Journal of Process Control*, **2005**, 15, 493-504	3.9	246
425	. *IEEE Transactions on Automatic Control*, **1994**, 39, 1000-1002	5.9	234
424	Robust nonlinear model predictive control of batch processes. *AICHE Journal*, **2003**, 49, 1776-1786	3.6	233
423	Paracetamol Crystallization Using Laser Backscattering and ATR-FTIR Spectroscopy: Metastability, Agglomeration, and Control. *Crystal Growth and Design*, **2002**, 2, 363-370	3.5	212
422	Advances and new directions in crystallization control. *Annual Review of Chemical and Biomolecular Engineering*, **2012**, 3, 55-75	8.9	211
421	Mathematical modeling of drug delivery from autocatalytically degradable PLGA microspheres--a review. *Journal of Controlled Release*, **2013**, 165, 29-37	11.7	211
420	High resolution algorithms for multidimensional population balance equations. *AICHE Journal*, **2004** , 50, 2738-2749	3.6	208
419	Closed-loop optimization of fast-charging protocols for batteries with machine learning. *Nature*, **2020**, 578, 397-402	50.4	191
418	Advanced control of crystallization processes. *Annual Reviews in Control*, **2002**, 26, 87-99	10.3	178

417	Open-loop and closed-loop robust optimal control of batch processes using distributional and worst-case analysis. *Journal of Process Control*, **2004**, 14, 411-422	3.9	169
416	Designer Dual Therapy Nanolayered Implant Coatings Eradicate Biofilms and Accelerate Bone Tissue Repair. *ACS Nano*, **2016**, 10, 4441-50	16.7	152
415	Data-driven Methods for Fault Detection and Diagnosis in Chemical Processes. *Advances in Industrial Control*, **2000**,	0.3	147
414	Distributional uncertainty analysis using power series and polynomial chaos expansions. *Journal of Process Control*, **2007**, 17, 229-240	3.9	146
413	Switched model predictive control of switched linear systems: Feasibility, stability and robustness. *Automatica*, **2016**, 67, 8-21	5.7	139
412	Modelling and control of combined cooling and antisolvent crystallization processes. *Journal of Process Control*, **2008**, 18, 856-864	3.9	136
411	Comparative performance of concentration and temperature controlled batch crystallizations. *Journal of Process Control*, **2008**, 18, 399-407	3.9	133
410	Solute concentration prediction using chemometrics and ATR-FTIR spectroscopy. *Journal of Crystal Growth*, **2001**, 231, 534-543	1.6	131
409	Direct Design of Pharmaceutical Antisolvent Crystallization through Concentration Control. *Crystal Growth and Design*, **2006**, 6, 892-898	3.5	126
408	Tunable staged release of therapeutics from layer-by-layer coatings with clay interlayer barrier. *Biomaterials*, **2014**, 35, 2507-17	15.6	123
407	High-Resolution Simulation of Multidimensional Crystal Growth. *Industrial & Engineering Chemistry Research*, **2002**, 41, 6217-6223	3.9	123
406	Optimal control and simulation of multidimensional crystallization processes. *Computers and Chemical Engineering*, **2002**, 26, 1103-1116	4	122
405	Optimal seeding in batch crystallization. *Canadian Journal of Chemical Engineering*, **1999**, 77, 590-596	2.3	119
404	Dynamics of surfactant-suspended single-walled carbon nanotubes in a centrifugal field. *Langmuir*, **2008**, 24, 1790-5	4	115
403	Determination of the Kinetic Parameters for the Crystallization of Paracetamol from Water Using Metastable Zone Width Experiments. *Industrial & Engineering Chemistry Research*, **2008**, 47, 1245-1252	3.9	115
402	Achieving continuous manufacturing: technologies and approaches for synthesis, workup, and isolation of drug substance. May 20-21, 2014 Continuous Manufacturing Symposium. *Journal of Pharmaceutical Sciences*, **2015**, 104, 781-91	3.9	108
401	Improved Filter Design in Internal Model Control. *Industrial & Engineering Chemistry Research*, **1996**, 35, 3437-3441	3.9	108
400	Parameter Estimation and Capacity Fade Analysis of Lithium-Ion Batteries Using Reformulated Models. *Journal of the Electrochemical Society*, **2011**, 158, A1048	3.9	106

399	Effect of pore size on adsorption of hydrocarbons in phenolic-based activated carbon fibers. *Carbon* , **1998**, 36, 123-129	10.4	101
398	Measurement of particle size distribution in suspension polymerization using in situ laser backscattering. *Sensors and Actuators B: Chemical*, **2003**, 96, 451-459	8.5	97
397	Constrained zonotopes: A new tool for set-based estimation and fault detection. *Automatica*, **2016**, 69, 126-136	5.7	95
396	Input design for guaranteed fault diagnosis using zonotopes. *Automatica*, **2014**, 50, 1580-1589	5.7	93
395	Stochastic nonlinear model predictive control with probabilistic constraints **2014**,		93
394	LIONSIMBA: A Matlab Framework Based on a Finite Volume Model Suitable for Li-Ion Battery Design, Simulation, and Control. *Journal of the Electrochemical Society*, **2016**, 163, A1192-A1205	3.9	93
393	Simulation of Mixing Effects in Antisolvent Crystallization Using a Coupled CFD-PDF-PBE Approach. *Crystal Growth and Design*, **2006**, 6, 1291-1303	3.5	92
392	Process monitoring using causal map and multivariate statistics: fault detection and identification. *Chemometrics and Intelligent Laboratory Systems*, **2003**, 65, 159-178	3.8	92
391	Robust performance of cross-directional basis-weight control in paper machines. *Automatica*, **1993**, 29, 1395-1410	5.7	92
390	A Stochastic Model for Nucleation Kinetics Determination in Droplet-Based Microfluidic Systems. *Crystal Growth and Design*, **2010**, 10, 2515-2521	3.5	89
389	Experimental design and inferential modeling in pharmaceutical crystallization. *AICHE Journal*, **2001**, 47, 160-168	3.6	86
388	Selective Crystallization of the Metastable □Form of l-Glutamic Acid using Concentration Feedback Control. *Crystal Growth and Design*, **2009**, 9, 3044-3051	3.5	85
387	Adaptive Concentration Control of Cooling and Antisolvent Crystallization with Laser Backscattering Measurement. *Crystal Growth and Design*, **2009**, 9, 182-191	3.5	83
386	Perspectives on process monitoring of industrial systems. *Annual Reviews in Control*, **2016**, 42, 190-200	10.3	82
385	Continuous-Flow Tubular Crystallization in Slugs Spontaneously Induced by Hydrodynamics. *Crystal Growth and Design*, **2014**, 14, 851-860	3.5	78
384	Solution Concentration Prediction for Pharmaceutical Crystallization Processes Using Robust Chemometrics and ATR FTIR Spectroscopy. *Organic Process Research and Development*, **2002**, 6, 317-322	3.9	76
383	Model-based design of a plant-wide control strategy for a continuous pharmaceutical plant. *AICHE Journal*, **2013**, 59, 3671-3685	3.6	74
382	Control systems engineering in continuous pharmaceutical manufacturing. May 20-21, 2014 Continuous Manufacturing Symposium. *Journal of Pharmaceutical Sciences*, **2015**, 104, 832-9	3.9	73

381	State-of-charge estimation in lithium-ion batteries: A particle filter approach. *Journal of Power Sources*, **2016**, 331, 208-223	8.9	72
380	Canonical variate analysis-based contributions for fault identification. *Journal of Process Control*, **2015**, 26, 17-25	3.9	71
379	Indirect Ultrasonication in Continuous Slug-Flow Crystallization. *Crystal Growth and Design*, **2015**, 15, 2486-2492	3.5	70
378	Kinetic Monte Carlo Simulation of Surface Heterogeneity in Graphite Anodes for Lithium-Ion Batteries: Passive Layer Formation. *Journal of the Electrochemical Society*, **2011**, 158, A363	3.9	70
377	ReviewDynamic Models of Li-Ion Batteries for Diagnosis and Operation: A Review and Perspective. *Journal of the Electrochemical Society*, **2018**, 165, A3656-A3673	3.9	70
376	Optimal Porosity Distribution for Minimized Ohmic Drop across a Porous Electrode. *Journal of the Electrochemical Society*, **2010**, 157, A1328	3.9	69
375	Worst-case and distributional robustness analysis of finite-time control trajectories for nonlinear distributed parameter systems. *IEEE Transactions on Control Systems Technology*, **2003**, 11, 694-704	4.8	69
374	Perspectives on the design and control of multiscale systems. *Journal of Process Control*, **2006**, 16, 193-204	3.9	67
373	IDENTIFICATION OF KINETIC PARAMETERS IN MULTIDIMENSIONAL CRYSTALLIZATION PROCESSES. *International Journal of Modern Physics B*, **2002**, 16, 367-374	1.1	66
372	Worst-case analysis of finite-time control policies. *IEEE Transactions on Control Systems Technology*, **2001**, 9, 766-774	4.8	65
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370	Opportunities and challenges of real-time release testing in biopharmaceutical manufacturing. *Biotechnology and Bioengineering*, **2017**, 114, 2445-2456	4.9	64
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368	Optimal model-based experimental design in batch crystallization. *Chemometrics and Intelligent Laboratory Systems*, **2000**, 50, 83-90	3.8	64
367	Layer number dependence of MoS2 photoconductivity using photocurrent spectral atomic force microscopic imaging. *ACS Nano*, **2015**, 9, 2843-55	16.7	63
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365	Estimation of the (n,m) concentration distribution of single-walled carbon nanotubes from photoabsorption spectra. *Analytical Chemistry*, **2006**, 78, 7689-96	7.8	63
364	Application of Continuous Crystallization in an Integrated Continuous Pharmaceutical Pilot Plant. *Crystal Growth and Design*, **2014**, 14, 2148-2157	3.5	60

363	Wiener's Polynomial Chaos for the Analysis and Control of Nonlinear Dynamical Systems with Probabilistic Uncertainties [Historical Perspectives]. *IEEE Control Systems*, **2013**, 33, 58-67	2.9	60
362	A combined canonical variate analysis and Fisher discriminant analysis (CVA□DA) approach for fault diagnosis. *Computers and Chemical Engineering*, **2015**, 77, 1-9	4	59
361	The Application of an Automated Control Strategy for an Integrated Continuous Pharmaceutical Pilot Plant. *Organic Process Research and Development*, **2015**, 19, 1088-1100	3.9	59
360	Efficient Simulation and Reformulation of Lithium-Ion Battery Models for Enabling Electric Transportation. *Journal of the Electrochemical Society*, **2014**, 161, E3149-E3157	3.9	57
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358	Diagnosis of multiple and unknown faults using the causal map and multivariate statistics. *Journal of Process Control*, **2015**, 28, 27-39	3.9	53
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356	Designs of continuous-flow pharmaceutical crystallizers: developments and practice. *CrystEngComm*, **2019**, 21, 3534-3551	3.3	51
355	Challenges and opportunities in biopharmaceutical manufacturing control. *Computers and Chemical Engineering*, **2018**, 110, 106-114	4	51
354	Effect of Additives on Shape Evolution during Electrodeposition. *Journal of the Electrochemical Society*, **2007**, 154, D230	3.9	50
353	A mechanistic model for drug release in PLGA biodegradable stent coatings coupled with polymer degradation and erosion. *Journal of Biomedical Materials Research - Part A*, **2015**, 103, 2269-79	5.4	49
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351	Indoor air quality control for improving passenger health in subway platforms using an outdoor air quality dependent ventilation system. *Building and Environment*, **2015**, 92, 407-417	6.5	49
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349	On-demand manufacturing of clinical-quality biopharmaceuticals. *Nature Biotechnology*, **2018**,	44.5	49
348	Robust Bayesian estimation of kinetics for the polymorphic transformation of L-glutamic acid crystals. *AICHE Journal*, **2008**, 54, 3248-3259	3.6	48
347	Optimal charging profiles for mechanically constrained lithium-ion batteries. *Physical Chemistry Chemical Physics*, **2014**, 16, 277-87	3.6	47
346	SVD controllers for H2□H□and □ptimal control. *Automatica*, **1997**, 33, 433-439	5.7	46

345	Screening tools for robust control structure selection. *Automatica*, **1995**, 31, 229-235	5.7	45
344	Optimal Charging Profiles with Minimal Intercalation-Induced Stresses for Lithium-Ion Batteries Using Reformulated Pseudo 2-Dimensional Models. *Journal of the Electrochemical Society*, **2014**, 161, F3144-F3155	3.9	44
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341	Closed-loop input design for guaranteed fault diagnosis using set-valued observers. *Automatica*, **2016**, 74, 107-117	5.7	44
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338	Parallel high-resolution finite volume simulation of particulate processes. *AICHE Journal*, **2008**, 54, 1449-1458	3.6	41
337	Cross-directional control of sheet and film processes. *Automatica*, **2007**, 43, 191-211	5.7	40
336	A hybrid multiscale kinetic Monte Carlo method for simulation of copper electrodeposition. *Journal of Computational Physics*, **2008**, 227, 5184-5199	4.1	40
335	Effect of Additives on Shape Evolution during Electrodeposition. *Journal of the Electrochemical Society*, **2007**, 154, D584	3.9	40
334	Robust identification and control of batch processes. *Computers and Chemical Engineering*, **2003**, 27, 1175-1184	4	40
333	Parameter Sensitivity Analysis of Monte Carlo Simulations of Copper Electrodeposition with Multiple Additives. *Journal of the Electrochemical Society*, **2003**, 150, C807	3.9	39
332	Perspective—Combining Physics and Machine Learning to Predict Battery Lifetime. *Journal of the Electrochemical Society*, **2021**, 168, 030525	3.9	39
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329	Elongated polyproline motifs facilitate enamel evolution through matrix subunit compaction. *PLoS Biology*, **2009**, 7, e1000262	9.7	37
328	Identification and Control of Sheet and Film Processes. *Advances in Industrial Control*, **2000**,	0.3	37

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326	Multi-Scale Simulation of Heterogeneous Surface Film Growth Mechanisms in Lithium-Ion Batteries. *Journal of the Electrochemical Society*, **2017**, 164, E3335-E3344	3.9	36
325	Towards achieving a flattop crystal size distribution by continuous seeding and controlled growth. *Chemical Engineering Science*, **2012**, 77, 2-9	4.4	36
324	Integrated batch-to-batch and nonlinear model predictive control for polymorphic transformation in pharmaceutical crystallization. *AICHE Journal*, **2011**, 57, 1008-1019	3.6	36
323	Control of defect concentrations within a semiconductor through adsorption. *Physical Review Letters*, **2006**, 97, 055503	7.4	36
322	Nucleation and growth kinetics estimation for L-phenylalanine hydrate and anhydrate crystallization. *CrystEngComm*, **2011**, 13, 1197	3.3	35
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319	Free surface electrospinning of aqueous polymer solutions from a wire electrode. *Chemical Engineering Journal*, **2016**, 289, 203-211	14.7	34
318	Optimum Charging Profile for Lithium-Ion Batteries to Maximize Energy Storage and Utilization. *ECS Transactions*, **2009**, 25, 139-146	1	34
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315	Real-time model predictive control for the optimal charging of a lithium-ion battery **2015**,		33
314	Nucleation and Growth Kinetics for Combined Cooling and Antisolvent Crystallization in a Mixed-Suspension, Mixed-Product Removal System: Estimating Solvent Dependency. *Crystal Growth and Design*, **2018**, 18, 1560-1570	3.5	33
313	Multiple-bond kinetics from single-molecule pulling experiments: evidence for multiple NCAM bonds. *Biophysical Journal*, **2005**, 89, 3434-45	2.9	33
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303	Active Fault Diagnosis for Nonlinear Systems with Probabilistic Uncertainties. *IFAC Postprint Volumes IPPV / International Federation of Automatic Control*, **2014**, 47, 7079-7084		28
302	Control of self-assembly in micro- and nano-scale systems. *Journal of Process Control*, **2015**, 27, 38-49	3.9	27
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300	Model predictive control of large scale processes. *Journal of Process Control*, **2000**, 10, 1-8	3.9	27
299	Fictitious phase separation in Li layered oxides driven by electro-autocatalysis. *Nature Materials*, **2021**, 20, 991-999	27	27
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296	Fault-tolerant model predictive control with active fault isolation **2013**,		25
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293	Optimal control and state estimation of lithium-ion batteries using reformulated models **2013**,		24
292	A thin-shell two-phase microstructural model for blown film extrusion. *Journal of Rheology*, **2010**, 54, 471-505	4.1	24

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281	Robust cross-directional control of large scale sheet and film processes. *Journal of Process Control*, **2001**, 11, 149-177	3.9	22
280	Two-Dimensional Contribution Map for Fault Identification [Focus on Education]. *IEEE Control Systems*, **2014**, 34, 72-77	2.9	21
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278	Model reduction for the robustness margin computation of large scale uncertain systems. *Computers and Chemical Engineering*, **1998**, 22, 913-926	4	21
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253	Design of active inputs for set-based fault diagnosis **2013**,		17
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