Juergen Hahn

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EDUCATION

Ph.D., Chemical Engineering University of Texas at Austin	2002
M.S., Chemical Engineering University of Texas at Austin	1998
Diploma, Chemical Engineering RWTH Aachen, Germany graduated Summa Cum Laude	1997

EXPERIENCE

Department Head Department of Biomedical Engineering Rensselaer Polytechnic Institute, Troy, New York	2013-
Professor Department of Biomedical Engineering Department of Chemical & Biological Engineering Rensselaer Polytechnic Institute, Troy, New York	2012-
Associate Professor Artie McFerrin Department of Chemical Engineering Texas A&M University, College Station, Texas	2009-2012
Assistant Professor Artie McFerrin Department of Chemical Engineering Texas A&M University, College Station, Texas	2003-2009
Post-Doctoral Researcher Process Systems Engineering (Advisor: Wolfgang Marquardt) RWTH Aachen, Aachen, Germany	2002-2003
Graduate Research Assistant Department of Chemical Engineering (Advisor: Thomas F. Edgar) University of Texas at Austin, Austin, Texas	1997–2001

HONORS AND AWARDS

BMES Fellow	2022
AIChE Fellow	2020
IEEE CSS Board of Governors	2016
Trustee of Computer Aids in Chemical Engineering (CACHE)	2014-
AIMBE Fellow	2013
CAST Outstanding Young Researcher Award	2010
Ray Nesbitt Professorship II	2010-2012
Keller Faculty Fellowship	2008-2009
Brockett Professorship	2008-2009

Best Paper Award, Chemical Process Control 7	2006
Outstanding Reviewer, Automatica	2005, '06, '07
Best Referee Award, Journal of Process Control	2004
William S. Livingston Graduate Fellowship	2001-2002
David Bruton, Jr. Graduate Fellowship	2000-2001
Springorum Medal	1998
Fulbright Scholarship	1995-1996

EDITORIAL ACTIVITIES

Deputy Editor-in-Chief, Journal of Process Control	2020-
Editor, Optimal Control: Applications and Methods (Biomedical Systems)	2020-
Editor, Processes (Biological Systems)	2018-2020
Editor, Journal of Process Control (Biological Systems, Estimation)	2013-2016
Associate Editor, Journal of Personalized Medicine	2022-
Associate Editor, Journal of Advanced Manufacturing and Processing	2020-
Associate Editor, Processes	2015-2020
Associate Editor, Automatica	2011-2014
Associate Editor, Journal of Process Control	2010-
Associate Editor, Control Engineering Practice	2007-
Guest Editor, Computers & Chemical Eng., Special Issue honoring Tom Edgar	2020
Guest Editor, Processes, Special Issue on Mod. & Anal. of Signal Transduction	2014
Guest Editor, Automatica, Special Issue on Systems Biology	2010

LEADERSHIP POSITIONS IN PROFESSIONAL COMMUNITY

AIChE CAST Division Director	2019-2021
Scientific Advisory Board, Autism Research Institute	2019-
Advisory Council, Chemical & Biomolecular Eng. Dept., Tulane University	2019-
AACC Investment Committee	2019-
AICHE CAST 10B Program Chair	2017
IEEE CSS Board of Governors	2016
Trustee of Computer Aids in Chemical Engineering (CACHE)	2014-
IFAC Publication Committee	2014-2017
Chair of the IFAC Policy Committee	2011-2014
Executive Board of IFAC	2011-2014
CACHE Systems Biology Task Force	2010-2014

Conference Organization
Conference chair

FOSBE: 7th IFAC Conf. Foundations of Systems Biology in Engineering	2018
41st Northeast Bioengineering Conference (NEBEC)	2015

Program chair

Symposium on Modeling of Complex Processes	2005

Program co-chair

American Control Conference: Vice Chair for Invited Sessions	2018
American Control Conference: Technical Program Committee (AIChE)	2017
FOSBE: 5th IFAC Conf. Foundations of Systems Biology in Engineering	2015
18th International Federation of Automatic Control World Congress	2011
American Control Conference: Program Committee	2010
17th International Federation of Automatic Control World Congress	2008

International program committee

FOCAPO/CPC: Foundations of Computer-Aided Process Operations and	2023

Chemical Process Control

DYCOPS-CAB: IFAC Conf. on Dyn. and Control of Process Systems, including Biosystems Symposium	2022
Adconip : Advanced Control of Industrial Processes	2022
CoDIT: 6th Int. Conf. on Control, Decision and Inform. Technologies	2019
FOSBE: 8th IFAC Conf. Foundations of Systems Biology in Engineering	2019
PSE: Process Systems Engineering	2018
MATHMOD: 9th Vienna Int. Conf. on Mathematical Modelling	2018
Adconip: Advanced Control of Industrial Processes	2017
DYCOPS: IFAC Symp. on Dynamics and Control of Process Systems	2016
FOSBE: 6th IFAC Conf. Foundations of Systems Biology in Engineering	2016
ADCHEM: Int. Symp. on Advanced Control of Chemical Processes	2015
Adconip: Advanced Control of Industrial Processes	2014
DYCOPS: IFAC Symp. on Dynamics and Control of Process Systems	2013
ADCHEM: Int. Symp. on Advanced Control of Chemical Processes	2012
FOSBE: 4th IFAC Conf. Foundations of Systems Biology in Engineering	2012
ICINCO: Int. Conf. on Inform. in Control, Automation and Robotics	2011
Adconip: Advanced Control of Industrial Processes	2011
ACC: American Control Conference	2010
FOSBE: 3rd IFAC Conf. Foundations of Systems Biology in Engineering	2009
ADCHEM: Int. Symp. on Advanced Control of Chemical Processes	2009
Adconip: Advanced Control of Industrial Processes	2008
ADCHEM: Int. Symp. on Advanced Control of Chemical Processes	2006

Service on Data and Safety Monitoring Board (DSMB)

Microbiota Transfer Therapy for Children with Autism Spectrum Disorder who Have Gastrointestinal Disorders (NCT04182633)	2019-2024
Microbiota Transfer Therapy for Children with both Pitt Hopkins Syndrome and Gastrointestinal Disorders (NCT04132427)	2019-2022
Microbiota Transfer Therapy for Adults with Autism Spectrum Disorder who Have Gastrointestinal Disorders (NCT03408886)	2018-2023

JOURNAL PUBLICATIONS (119 total, selected listing)

- G. Grivas, R.E. Frye, and J. Hahn. Maternal Risk Factors vary between Subpopulations of Children with Autism Spectrum Disorder. *Autism Research*, In Press (2022).
- J. Chuah, U. Kruger, G. Wang, P. Yan, and J. Hahn. Framework for Testing Robustness of Machine Learning-Based Classifiers. *Journal of Personalized Medicine* **12**, Vol. 8, 1314 (2022).
- F. Qureshi, J.B. Adams, T. Audhya, and J. Hahn. Multivariate Analysis of Metabolomic and Nutritional Profiles among Children with Autism Spectrum Disorder. *Journal of Personalized Medicine* **12**, No. 6, 923 (2022).
- F. Qureshi and J. Hahn. Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Big Data Meets Metabolomics. *Canadian Journal of Chemical Engineering*, In Press (2022).
- U. Kruger, X. Wang, M.J. Embrechts, A. Almansoori, and J. Hahn. Regularized Error-in-Variable Estimation for Big Data Modeling and Process Analytics. *Control Engineering Practice* **121**, 105060 (2022).
- H. Kerr, E. Ledet, J. Hahn, and K. Hollowood-Jones. Accurate Prediction of Successful Return to Sports from Sports-Related Concussion (SRC) is Enhanced by Quantitative Assessment of Balance in a Cohort of Youth Concussions with Tracked Recovery. *Sports Health: A Multidisciplinary Approach*, In Press (2022).
- G. Grivas, R.E. Frye, and J. Hahn. Pregnant Mothers' Medical Claims and Associated Risk of their Children being Diagnosed with Autism Spectrum Disorder. *Journal of Personalized Medicine* **11**, No. 10, 950 (2021).
- S.M. Quinn, T. Vargason, N. Pokhrel, E. Antony, J. Hahn, and S.P. Gilbert. KIF3A Accelerates KIF3C within the Kinesin-2 Heterodimer to Generate Symmetrical Phosphate Release Rates for each Processive Step. *Journal of Biological Chemistry* **296**, 100020 (2021).

- K. Hollowood-Jones, J.B. Adams, D.M. Coleman, S. Ramamoorthy, S. Melnyk, S.J. James, B.K. Woodruff, E.L. Pollard, C.L. Snozek, U. Kruger, J. Chuah, and J. Hahn. Altered Metabolism of Mothers of Young Children with Autism Spectrum Disorder: A Case Control Study. *BMC Pediatrics* **20**, 557 (2020).
- F. Qureshi, J.B. Adams, K. Hanagan, D.-W. Kang, R. Krajmalnik-Brown, and J. Hahn. Multivariate Analysis of Fecal Metabolites from Children with Autism Spectrum Disorder and Gastrointestinal Symptoms. *Journal of Personalized Medicine* **10**, No. 4, 152 (2020). **Editor's Choice**
- D.-W. Kang, J.B. Adams, T. Vargason, M. Santiago, J. Hahn, and R. Krajmalnik-Brown. Distinct Fecal and Plasma Metabolites in Children with Autism Spectrum Disorders and their Modulation after Microbiota Transfer Therapy. *mSphere* 5:e00314-20 (2020). **Editor's Pick**
- T. Vargason, E. Roth, G. Grivas, J. Ferina, R.E. Frye, and J. Hahn. Classification of Autism Spectrum Disorder from Blood Metabolites: Robustness to the Presence of Co-occurring Conditions. *Research in Autism Spectrum Disorders* **77**, 101644 (2020).
- E. Lopez, J. Hahn, L. M. Gómez Echavarría, and H. Alvarez. Input Trajectory Design for the Enhancement of State Estimation through a Set-theoretic Approach to Observability. *Industrial & Engineering Chemistry Research* **59**, No. 30, pp. 13631–13641 (2020).
- S. Maiti, G. Grivas, K. Choi, W. Dai, Y. Ding, D. Penarete Acosta, J. Hahn, and A. Jayaraman. Modeling Inter-Kingdom Regulation of Inflammatory Signaling in Human Intestinal Epithelial Cells. *Computers and Chemical Engineering* **140**, 106954 (2020).
- F. Qureshi, J.B. Adams, D. Coleman, D. Quig, and J. Hahn. Urinary Essential Elements of Young Children with Autism Spectrum Disorder and their Mothers. *Research in Autism Spectrum Disorders* **72**: 101518 (2020).
- F. Fan, H. Shan, M.K. Kalra, R. Singh, G. Qian, M. Getzin, Y. Teng, J. Hahn, and G. Wang. Quadratic Autoencoder (Q-AE) for Low-dose CT Denoising. *IEEE Transactions on Medical Imaging* **39**, No. 6, pp. 2035-2050 (2020).
- T. Vargason, G. Grivas, K.L. Hollowood-Jones, and J. Hahn. Towards a Multivariate Biomarker-based Diagnosis of Autism Spectrum Disorder: Review and Discussion of Recent Advancements. *Seminars in Pediatric Neurology* **34**, 100803 (2020).
- G. Grivas, T. Vargason, and J. Hahn. Biomarker Identification of Complex Diseases/Disorders: Methodological Parallels to Parameter Estimation. *Industrial & Engineering Chemistry Research* **59**, No. 6, pp. 2366-2377 (2020). **Journal Cover**
- T. Vargason, R.E. Frye, D.L. McGuinness, and J. Hahn. Clustering of Co-occurring Conditions in Autism Spectrum Disorder during Early Childhood: A Retrospective Analysis of Medical Claims Data. *Autism Research* **12**, No. 8, pp. 1272–1285 (2019).
- T. Vargason, D.L. McGuinness, and J. Hahn. Gastrointestinal Symptoms and Oral Antibiotic Use in Children with Autism Spectrum Disorder: Retrospective Analysis of a Privately Insured U.S. Population. *Journal of Autism and Developmental Disorders* **49**, No. 2, pp. 647-659 (2019).
- T. Vargason, U. Kruger, E. Roth, L.M. Delhey, M. Tippett, S. Rose, S.C. Bennuri, J.C. Slattery, S. Melnyk, S.J. James, R.E. Frye, and J. Hahn. Comparison of Three Clinical Trial Treatments for Autism Spectrum Disorder through Multivariate Analysis of Changes in Metabolic Profiles and Adaptive Behavior. *Front. Cell. Neurosci.* 12:503 (2018).
- K.L. Hollowood, S. Melnyk, O. Pavliv, T. Evans, A. Sides, R.J. Schmidt, I. Hertz-Picciotto, W. Elms, E. Guerrero, U. Kruger, J. Hahn, and S.J. James. Maternal Metabolic Profile Predicts High or Low Risk of an Autism Pregnancy Outcome. *Research in Autism Spectrum Disorders* **56**, pp. 72-82 (2018).
- D.P. Howsmon, T. Vargason, R.A. Rubin, L. Delhey, M. Tippett, S. Rose, S.C. Bennuri, J.C. Slattery, S. Melnyk, S.J. James, R.E. Frye, and J. Hahn. Multivariate Techniques Enable a Biochemical Classification of Children with Autism Spectrum Disorder versus Typically-Developing Peers: A Comparison and Validation Study. *Bioengineering & Translational Medicine* **3**, No. 2, pp. 156-165 (2018).
- K. Connery, M. Tippett, L. Delhey, S. Rose, J. Slattery, S.G. Kahler, J. Hahn, U. Kruger, M.W. Cunningham, C. Shimasaki, and R.E. Frye. Intravenous Immunoglobulin for the Treatment of Autoimmune Encephalopathy in Children with Autism. *Translational Psychiatry* **8**: 148 (2018).
- A. Sinkoe, A. Jayaraman, and J. Hahn. Dynamic Optimal Experimental Design Yields Marginal Improvement over Steady-state Results for Computational Maximization of Regulatory T Cell Induction in ex vivo Culture. *IET Systems Biology* **12**, No. 6, pp. 241-246 (2018).

- T. Vargason, D.P. Howsmon, and J. Hahn. From Data to Diagnosis: The Search for Biochemical Markers of Autism Spectrum Disorder. *Chemical Engineering Progress* **114**, No. 5, pp. 40-45 (2018).
- T. Vargason, U. Kruger, D.L. McGuinness, J.B. Adams, E. Geis, E. Gehn, D. Coleman, and J. Hahn. Investigating Plasma Amino Acids for Differentiating Individuals with Autism Spectrum Disorder and Typically Developing Peers. *Research in Autism Spectrum Disorders* **50**, pp. 60-72 (2018).
- D.P. Howsmon, J.B. Adams, U. Kruger, E. Geis, E. Gehn, and J. Hahn. Erythrocyte Fatty Acid Profiles in Children Are Not Predictive of Autism Spectrum Disorder Status: A Case Control Study. *Biomarker Research* **6**:12 (2018).
- D.-W. Kang, Z.E. Ilhan, N.G. Isern, D.W. Hoyt, D.P. Howsmon, M. Shaffer, C.A. Lozupone, J. Hahn, J.B. Adams, and R. Krajmalnik-Brown. Differences in Fecal Microbial Metabolites and Microbiota of Children with Autism Spectrum Disorders. *Anaerobe* **49**, pp. 121-131 (2018).
- S. Steinmeyer, D.P. Howsmon, R.C. Alaniz, J. Hahn, and A. Jayaraman. Empirical Modeling of T cell Activation Predicts Interplay of Host Cytokines and Bacterial Indole. *Biotechnology & Bioengineering* **114**, No. 11, pp. 2660-2667 (2017).
- T. Vargason, D.P. Howsmon, D.L. McGuinness, and J. Hahn. On the Use of Multivariate Methods for Analysis of Data from Biological Networks. *Processes* **5**, No. 3: 36 (2017).
- D.P. Howsmon, U. Kruger, S. Melnyk, S.J. James, and J. Hahn. Classification and Adaptive Behavior Prediction of Children with Autism Spectrum Disorder based upon Multivariate Data Analysis of Markers of Oxidative Stress and DNA Methylation. *PLoS Computational Biology* 13(3): e1005385 (2017). **Journal Cover**
- J.B. Adams, D.P. Howsmon, U. Kruger, E. Geis, E. Gehn, V. Fimbres, E. Pollard, J. Mitchell, J. Ingram, R. Hellmers, D. Quig, and J. Hahn. Significant Association of Urinary Toxic Metals and Autism-Related Symptoms - A Nonlinear Statistical Analysis with Cross Validation. *PLoS ONE* 12(1): e0169526 (2017).
- D.P. Howsmon, F. Cameron, N. Baysal, T.T. Ly, G.P. Forlenza, D.M. Maahs, B.A. Buckingham, J. Hahn, and B.W. Bequette. Continuous Glucose Monitoring Enables Detection of Losses in Infusion Set Actuation (LISAs). *Sensors* **17**(1), 161 (2017).
- T. Vargason, D.P. Howsmon, S. Melnyk, S.J. James, and J. Hahn. Mathematical Modeling of the Methionine Cycle and Transsulfuration Pathway in Individuals with Autism Spectrum Disorder. *Journal of Theoretical Biology* **416**, pp. 28-37 (2017).
- S. Tututi-Avila, L.A. Domínguez-Díaz, N. Medina-Herrera, A. Jiménez-Gutiérrez, and J. Hahn. Dividing-Wall Columns: Design and Control of a Kaibel and a Satellite Distillation Column for BTX Separation. *Chemical Engineering and Processing: Process Intensification* **114**, pp. 1-15 (2017).
- S. Tututi-Avila, N. Medina-Herrera, J. Hahn, and A. Jiménez-Gutiérrez. Design of an Energy-Efficient Side-Stream Extractive Distillation System. *Computers and Chemical Engineering* **102**, pp. 17-25 (2017).
- D. Howsmon and J. Hahn. Regularization Techniques to Overcome Over-Parameterization of Complex Biochemical Reaction Networks. *IEEE Life Science Letters* **2**, No. 3, pp. 31-34 (2016).
- J.A. Jones, V.R. Vernacchio, A.L. Sinkoe, S.M. Collins, M.H. Ibrahim, D.M. Lachance, J. Hahn, M.A. Koffas. Experimental and Computational Optimization of an Escherichia Coli Co-culture for the Efficient Production of Flavonoids. *Metabolic Engineering* **35**, pp. 55-63 (2016).
- T. Omer, X. Intes, and J. Hahn. Temporal Data Set Reduction Based on D-optimality for Quantitative FLIM-FRET Imaging. *PLoS ONE* 10(12): e0144421 (2015).
- P. Zhang, W. Dai, J. Hahn, and S.P. Gilbert. Drosophila Ncd Reveals an Evolutionarily Conserved Powerstroke Mechanism for Homodimeric and Heterodimeric Kinesin-14s. *PNAS* **112**, No. 20, pp. 6359-6364 (2015).
- G. Zheng, D. Howsmon, B. Zhang, J. Hahn, D. McGuinness, J. Hendler, and H. Ji. Entity linking for biomedical literature. *BMC Medical Informatics and Decision Making* **15**, No. S1, S4. (2015).
- W. Dai, J. Kang, and J. Hahn. Reconstruction of Transcription Factor Profiles via Dynamic Optimization and Tikhonov Regularization. *AIChE Journal* **60**, No. 11, pp. 3754–3761 (2014).
- T. Omer, L. Zhao, X. Intes, and J. Hahn. Reduced Temporal Sampling Effect on Time-domain Fluorescence Lifetime FRET Accuracy. *Journal of Biomedical Optics* **19**, No. 8, 086023 (2014).
- S. Tututi-Avila, A. Jimenez-Gutierrez, and J. Hahn. Control Analysis of an Extractive Dividing-Wall Column used for Ethanol Dehydration. *Chemical Engineering and Processing: Process Intensification* **82**, pp. 88-100 (2014).

- V. Mahindrakar and J. Hahn. Dynamics and Control of Benzene Hydrogenation via Reactive Distillation. *Journal of Process Control* **24**, pp. 113– 124 (2014).
- W. Dai, L. Bansal, D. Word, and J. Hahn. Parameter Set Selection for Dynamic Systems under Uncertainty via Dynamic Optimization and Hierarchical Clustering **60**, No. 1, *AIChE Journal*, pp. 181–192 (2014). **Top Tier Contribution**
- W. Dai, D. Word, and J. Hahn. Modeling and Dynamic Optimization of Fuel-grade Ethanol Fermentation Using Fed-batch Process. *Control Engineering Practice* **22**, pp. 231–241 (2014).
- L. Bansal, R. Nelson, E. Yang, A. Jayaraman, and J. Hahn. Experimental Design of Systems Involving Multiple Fluorescent Protein Reporters. *Chemical Engineering Science* **101**, pp. 191-198 (2013).
- C. Kravaris, J. Hahn, and Y. Chu. Advances and Selected Recent Developments in State and Parameter Estimation. *Computers & Chemical Engineering* **51**, pp. 111-123 (2013). **Invited Paper**
- M. Serpas, G. Hackebeil, C. Laird, and J. Hahn. Sensor Location for Nonlinear Dynamic Systems via Observability Analysis and Max-Det Optimization. *Computers & Chemical Engineering* **48**, No. 1, pp. 105-112 (2013).
- L. Bansal, Y. Chu, C. Laird, and J. Hahn. Regularization of Inverse Problems to Determine Transcription Factor Profiles from Fluorescent Reporter Systems. *AIChE Journal* **58**, No. 12, pp. 3751-3762 (2012).
- Z. Huang, Y. Chu, and J. Hahn. Computing Transcription Factor Distribution Profiles from Green Fluorescent Protein Reporter Data. *Chemical Engineering Science* **68**, No. 1, pp. 340-354 (2012).
- Y. Chu and J. Hahn. Generalization of a Parameter Set Selection Procedure based upon Orthogonal Projections and the D-Optimality Criterion. *AIChE Journal* **58**, No. 7, pp. 2085-2096 (2012).
- Y. Chu, Z. Huang, and J. Hahn. Global Sensitivity Analysis Procedure Accounting for Effect of Available Experimental Data. *Industrial & Engineering Chemistry Research* **50**, No. 3, pp. 1294-1304 (2011).
- C. Moya, Z. Huang, P. Cheng, A. Jayaraman, and J. Hahn. Investigation of IL-6 and IL-10 Signaling via Mathematical Modeling. *IET Systems Biology* **5**, No. 1, pp. 15-26 (2011).
- Z. Huang, C. Moya, A. Jayaraman, and J. Hahn. Using the Tet-On System to Develop a Procedure for Extracting Transcription Factor Activation Dynamics. *Molecular BioSystems* **6**, No. 10, pp. 1883-1889 (2010).
- Z. Huang, Y. Chu, and J. Hahn. Model Simplification Procedure for Signal Transduction Pathway Models: An Application to IL-6 Signaling. *Chemical Engineering Science* **65**, No. 6, pp. 1964-1975 (2010).
- Z. Huang, Y. Chu, B. Cunha, and J. Hahn. Generalization of a Procedure for Computing Transcription Factor Profiles. *IET Systems Biology* **4**, No. 2, pp. 108-118 (2010).
- Y. Chu, Z. Huang, and J. Hahn. Improving Prediction Capabilities of Complex Dynamic Models via Parameter Selection and Estimation. *Chemical Engineering Science* **64**, No. 19, pp. 4178-4185 (2009).
- Y. Chu and J. Hahn. Parameter Set Selection via Clustering of Parameters into Pair-wise Indistinguishable Groups of Parameters. *Industrial & Engineering Chemistry Research* **48**, No.13, pp. 6000-6009 (2009).
- Z. Huang and J. Hahn. Fuzzy Modeling of Signal Transduction Networks. *Chemical Engineering Science* **64**, No. 9, 2044-2056 (2009).
- C. Qu and J. Hahn. Computation of Arrival Cost for Moving Horizon Estimation via Unscented Kalman Filtering. *Journal of Process Control* **19**, No.2, 358-363 (2009).
- Z. Huang, F. Senocak, A. Jayaraman, and J. Hahn. Integrated Modeling and Experimental Approach for Determining Transcription Factor Profiles from Fluorescent Reporter Data. *BMC Systems Biology* **2**:64 (2008). **Highly Accessed**
- Y. Chu and J. Hahn. Integrating Parameter Selection with Experimental Design under Uncertainty for Nonlinear Dynamic Systems. *AIChE Journal* **54**, No. 9, pp. 2310-2320 (2008).
- Y. Chu and J. Hahn. Parameter Set Selection for Estimation for Nonlinear Dynamic Systems. *AIChE Journal* **53**, No. 11, pp. 2858-2870 (2007).
- Y. Chu, A.K. Singh, A. Jayaraman, and J. Hahn. Parameter Sensitivity Analysis of IL-6 Signaling Pathways. *IET Systems Biology* **1**, No. 6, pp. 342-352 (2007).

- Y. Chu, and J. Hahn. Development of Parameter Sensitivity Analysis Techniques for Studying Interactions among Parameters and Application to Systems Biology. *Dynamics of Continuous, Discrete and Impulsive Systems* **14**, No. S2, pp. 220-226, (2007).
- A.K. Singh, A. Jayaraman, and J. Hahn. A Case Study of Representing Signal Transduction in Liver Cells as a Feedback Control Problem. *Chemical Engineering Education* **41**, No. 3, pp. 177-182 (2007).
- A.K. Singh, A. Jayaraman, and J. Hahn. Modeling Regulatory Mechanisms in IL-6 signal transduction in Hepatocytes. *Biotechnology & Bioengineering* **95**, No. 5, pp. 850-862 (2006).
- A.K. Singh and J. Hahn. Determining Optimal Sensor Locations for Stable Nonlinear Dynamic Systems: the Multiple Sensor Case. *Industrial & Engineering Chemistry Research* **45**, No. 10, pp. 3615-3623 (2006).
- C. Sun and J. Hahn. Model Reduction in the Presence of Uncertainty in Model Parameters, *Journal of Process Control* **16**, No. 6, pp. 645-649 (2006).
- A.K. Singh and J. Hahn. Determining Optimal Sensor Locations for State and Parameter Estimation for Stable Nonlinear Systems. *Industrial & Engineering Chemistry Research* **44**, No. 15, pp. 5645-5659 (2005).
- C. Sun and J. Hahn. Reduction of Differential-Algebraic Equation Systems via Projections and System Identification. *Journal of Process Control* **15**, No. 6, pp. 639-650 (2005).
- J. Hahn, M. Mönnigmann, and W. Marquardt. A Method for Robustness Analysis of Controlled Nonlinear Systems. *Chemical Engineering Science* **59**, No. 20, pp. 4325-4338 (2004).
- J. Hahn, T.F. Edgar, and W. Marquardt. Controllability and Observability Covariance Matrices for the Analysis and Order Reduction of Nonlinear Systems. *Journal of Process Control* **13**, No. 2, pp. 115-127 (2003).
- J. Hahn and T.F. Edgar. An Improved Method for Nonlinear Model Reduction Using Balancing of Empirical Gramians. *Computers and Chemical Engineering* **26**, No. 10, pp. 1379-1397 (2002).
- J. Hahn and T.F. Edgar. Balancing Approach to Minimal Realization and Model Reduction of Stable Nonlinear Systems. *Industrial & Engineering Chemistry Research* **41**, No. 9, pp. 2204-2212 (2002).
- J. Hahn, T. Edison, and T.F. Edgar. Adaptive IMC Control for Drug Infusion for Biological Systems. *Control Engineering Practice* **10**, No. 1, pp. 45-56 (2002).
- J. Hahn and T.F. Edgar. A Gramian Based Approach to Nonlinearity Quantification and Model Classification. *Industrial & Engineering Chemistry Research* **40**, No. 24, pp. 5724-5731 (2001).
- T.F. Edgar, S.W. Butler, J. Campbell, C. Pfeiffer, C. Bode, S.B. Hwang, K.S. Balakrishnan, and J. Hahn. Automatic Control in Microelectronics Manufacturing: Practices, Challenges, and Possibilities. *Automatica* **36**, No. 11, pp. 1567-1603 (2000).

BOOKS AND BOOK CHAPTERS

- J. Hahn and B.W. Bequette. Process Automation. *Handbook of Automation,* 2nd edition, S.Y. Nof (editor), Springer-Verlag, New York, In Press (2022).
- T.F. Edgar, C.L. Smith, B.W. Bequette, and J. Hahn. Process Control. *Perry's Chemical Engineers' Handbook*, 9th edition, D.W. Green and M.Z. Southard (editors). McGraw-Hill, New York (2018).
- J. Hahn (editor). *Modeling and Analysis of Signal Transduction Networks*. ISBN-13: 978-3-03842-141-2, MDPI AG, Basel, Switzerland (2016).
- J. Hahn and T.F. Edgar. Process Control. *Kirk-Othmer Encyclopedia of Chemical Technology,* 6th edition, John Wiley & Sons, New York (2014).
- W. Dai and J. Hahn. Batch Control and Trajectory Optimization in Fuel Ethanol Production. *The Impact of Control Technology.* 2nd edition, T. Samad and A. Annaswamy (editors). IEEE Control Systems Society (2014).
- Y. Chu and J. Hahn. Optimal Experiment Design, Signal Transduction Pathways. *Encyclopedia of Systems Biology*, Springer-Verlag, New York, pp. 1572-1573 (2013).
- A. Jayaraman and J. Hahn (editors). *Methods in Bioengineering: Systems Analysis of Biological Networks*. ISBN-13: 978-1-59693-406-1, Artech House, Boston, Massachusetts (2009).
- Z. Huang and J. Hahn. Comparison of Algorithms for Analyzing Fluorescent Microscopy Images and Computation of Transcription Factor Profiles. *Methods in Bioengineering: Systems Analysis of Biological Networks*, Artech House, Boston, Massachusetts, pp. 33-56 (2009).

- T.F. Edgar and J. Hahn. Process Automation. *Handbook of Automation,* S.Y. Nof (editor), Springer-Verlag, New York, pp. 529-543 (2009).
- J. Hahn and T.F. Edgar. Process Control. *Kirk-Othmer Concise Encyclopedia of Chemical Technology,* 5th edition, John Wiley & Sons, New York (2007).
- S. Rajaraman, U. Kruger, M.S. Mannan, and J. Hahn, A New Sensor Fault Diagnosis Technique Based Upon Subspace Identification and Residual Filtering., *Computational Intelligence*, LNAI, Vol. 4114, Springer, Heidelberg, Germany, pp. 990-998 (2006).
- T.F. Edgar and J. Hahn. Process Dynamics and Control. *The Electronics Handbook,* 3rd edition, CRC Press, Boca Raton, Florida, pp. 1974-1995 (2004).
- M. Mönnigmann, J. Hahn, and W. Marquardt. Towards Constructive Nonlinear Dynamics in Chemical Engineering. *Nonlinear Dynamics of Production Systems*, Wiley-VCH, Weinheim, Germany, pp. 503-526 (2004).
- J. Hahn and T.F. Edgar. Process Control. *Kirk-Othmer Encyclopedia of Chemical Technology,* 5th edition, John Wiley & Sons, New York (2003).
- J. Hahn and T.F. Edgar. Process Control Systems. *Encyclopedia of Physical Science and Technology*, 3rd edition, 3rd edition, Vol. 13, Academic Press, San Diego, California, pp. 111-126 (2001).

INVITED TALKS (55 total, only selected are listed)

- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Data Science Meets Metabolomics. Foundations of Systems Biology in Engineering, August 29, 2022. Cambridge, Massachusetts.
- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Data Science Meets Metabolomics. Ezra's Round Table Systems Seminar, Cornell University, March 11, 2022, Ithaca, New York.
- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Data Science Meets Metabolomics. Department of Biomedical Engineering, New York University, November 23, 2021, New York City, New York.
- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Data Science Meets Metabolomics. Department of Biomedical Engineering, Columbia University, September 24, 2021, New York City, New York.
- Machine Learning of Metabolomics Data of Folate-Dependent One-Carbon Metabolism and Transsulfuration Pathways in Autism Spectrum Disorder. Synchrony 2020, December 13, 2020, Virtual Conference.
- Integrating Data Science Advances into Chemistry and Chemical Engineering Curriculums. Board on Chemical Sciences and Technology, National Academies of Sciences, Engineering, and Medicine, August 23, 2019, Washington, D.C.
- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Big Data Meets Metabolomics. School of Chemical Engineering, Oklahoma State University, October 9, 2018, Stillwater, Oklahoma.
- Towards the Development of a Diagnostic Test for Autism Spectrum Disorder: Big Data Meets Metabolomics. Department of Chemical Engineering, Worcester Polytechnic Institute, April 18, 2018, Worcester, Massachusetts.
- Role of Folate-Dependent One-Carbon Metabolism and Transulfuration Pathways in Autism Spectrum Disorder. Bioengineering & Translational Medicine Conference, October 29, 2017, Minneapolis, Minnesota.
- Personalized Medicine: Importance of Estimating Model Parameters. Department of Physics, Morehouse College, September 8, 2016, Atlanta, Georgia.
- Regularization Techniques for Biochemical Reaction Networks. Foundations of Systems Biology in Engineering, August 11, 2015. Cambridge, Massachusetts.
- Signal Transduction Pathway Modeling: Investigation and Challenges of IL-6 Signaling. Department of Biomedical Engineering, Columbia University, May 1, 2015, New York City, New York.
- Signal Transduction Pathway Modeling: Investigation and Challenges of IL-6 Signaling. Department of Chemical Engineering, Queen's University, January 15, 2015, Kingston, Ontario, Canada.

- Signal Transduction Pathway Modeling: Investigation and Challenges of IL-6 Signaling. Process Systems Engineering Laboratory, Massachusetts Institute of Technology, July 18, 2014, Cambridge, Massachusetts.
- Use of Systems Biology Concepts for Signal Transduction Pathway Modeling. Icahn School of Medicine, Mount Sinai, March 18, 2014, New York City, New York.
- Use of Systems Biology Concepts for Signal Transduction Pathway Modeling. Department of Chemical Engineering, University of Massachusetts at Amherst, November 13, 2012, Amherst, Massachusetts.
- Use of Systems Biology Concepts for Signal Transduction Pathway Modeling. Workshop on Model-based Analysis and Control of Cellular Processes, Purdue University, October 9, 2012, West Lafayette, Indiana.
- Developing Improved Models of Signal Transduction Pathways via Systems Biology. Department of Chemical Engineering, University of Texas at Austin, September 13, 2011, Austin, Texas.
- Developing Improved Models of Signal Transduction Pathways via Systems Biology. Department of Chemical and Biomolecular Engineering, Cornell University, March 14, 2011, Ithaca, New York.
- Developing Improved Models of Signal Transduction Pathways via Systems Biology. Department of Chemical Engineering, University of Arkansas, December 7, 2010, Fayetteville, Arkansas.
- Nonlinear Model Reduction. Air Liquide Delaware Research & Technology Center, September 16, 2010, Newark, Delaware.
- Connecting Academia to Industry - Trends in Engineering Programs, Curriculums, and Workforce Development. ISA Expo, October 6, 2009, Houston, Texas.
- Developing Improved Models of Signal Transduction Pathways via Systems Biology. School of Chemical and Biomolecular Engineering, Georgia Institute of Technology, January 14, 2009, Atlanta, Georgia.
- Sensitivity Analysis used for Parameter Estimation of Signal Transduction Networks. SIAM Conference on the Life Sciences, August 4, 2008, Montreal, Canada.
- Computing Transcription Factor Concentrations from Green Fluorescent Protein Reporter System Data. National Taiwan University, July 14, 2008, Taipei, Taiwan.
- Fuzzy Modeling of Signal Transduction Networks. International Federation of Automatic Control World Congress, July 11, 2008, Seoul, Korea.
- Modeling Regulatory Mechanisms in IL-6 Signal Transduction in Hepatocytes, Department of Chemical and Petroleum Engineering, University of Pittsburgh, March 23, 2007, Pittsburgh, Pennsylvania.
- Modeling Regulatory Mechanisms in IL-6 Signal Transduction in Hepatocytes, Department of Chemical Engineering, Auburn University, November 29, 2006, Auburn, Alabama.
- Nonlinear Model Reduction and its Application to Model Predictive Control. Department of Computational & Applied Mathematics, Rice University, April 17, 2006, Houston, Texas.
- Determining Optimal Sensor Locations for State and Parameter Estimation. ExxonMobil, April 12, 2006, Baytown, Texas.
- Analysis and Order Reduction of Nonlinear Systems and Application to Model Predictive Control. Department of Chemical Engineering, Worcester Polytechnic Institute, March 19, 2004, Worcester, Massachusetts.
- Modeling, Analysis, Optimization and Control of Complex Dynamic Systems. Shell, August, 2003, Houston, Texas.
- Analysis and Order Reduction of Nonlinear Systems and Application to Model Predictive Control. School of Electrical & Electronic Engineering, Queen's University Belfast, March 13, 2003, Belfast, United Kingdom.
- Nonlinear Model Reduction and its Application to Model Predictive Control. Center for Chemical Process Design and Control, Lund Institute of Technology, November 18, 2002, Lund, Sweden.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Department of Chemical Engineering, Purdue University, April 2, 2002, West Lafayette, Indiana.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Department of Chemical Engineering, University of Massachusetts at Amherst, March 14, 2002, Amherst, Massachusetts.

- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Department of Chemical Engineering, Texas A&M University, January 10, 2002, College Station, Texas.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Department of Chemical Engineering, Georgia Institute of Technology, January 7, 2002, Atlanta, Georgia.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Institut für Systemtheorie Technischer Prozesse, Universität Stuttgart, May 14, 2001, Stuttgart, Germany.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Max Planck Institut für Dynamik komplexer technischer Systeme, May 9, 2001, Magdeburg, Germany.
- Analysis of Nonlinear Systems via Controllability and Observability Covariance Matrices. Lehrstuhl für Prozesstechnik, RWTH Aachen, May 7, 2001, Aachen, Germany.

PATENTS AND PATENT APPLICATIONS

- J. Hahn, T. Vargason, and U. Kruger. Use of Multivariate Analysis to Assess Treatment Approaches. U.S. Patent Application No. 17/413,354, 2022.
- J. Adams, J. Hahn, and H. Guo. Diagnostic for Childhood Risk of Autism Spectrum Disorder. U.S. Patent Application No. 17/601,235, 2022.
- J. Adams and J. Hahn. Diagnostic for Maternal Risk of Having a Child with Autism Spectrum Disorder. U.S. Patent Application No. 17/601,582, 2022.
- J. Adams, J. Hahn, D.-W. Kang, and R. Krajmalnik-Brown. Metabolites as Diagnostics for Autism Spectrum Disorder in Children with Gastrointestinal Symptoms. U.S. Patent Application No. 17/601,219, 2022.
- G. Wang, M. Kalra, J. Hahn, U. Kruger, W. Cong, and H. Shan. Systems and Methods for Integrating Tomographic Image Reconstruction and Radiomics using Neural Networks. US Patent 11,049,244, 2021.
- J. Hahn, D. Howsmon, and U. Kruger. Method for Predicting Autism. U.S. Patent Application No. 16/002,329, 2018.

STUDENT SUPERVISION

- Undergraduate (27 directly supervised, listed here, and 90 students as REU supervisor)
  Jacob I. Kasper, Michael L. Skinner, Jeremy Brewer, Robert Cox, Bernardo Cunha, Keith Weatherford, Jacob Heartsfield, Zuleika Oguendo-Diaz, Steven Fnu, Mark Deimund, David McDonald, Srikanth Parthasarathy, Navarro Dunie, Randall Nelson, Samuel Congiundi, David Chaar, Jenna Ahlborn, Catherine Kennedy, Jean Fecteau, Matthew Williams, Gary Shea, Edward Heronzy, Samad Emory, Emily Roth, Joshua Chuah, SummerRay Morrow, Kathryn Hanagan
- Masters (4 as main supervisor, listed here, and 16 as committee member)
  Arnab Chakrabarty, Obanifemi Aluko, Arjun Bhadouria, Mohamed Omer
- Doctoral (27 as main supervisor, listed here, and 53 as committee member)
  Won-Hyouk Jang, Yifeng Zhou, Srinivasan Rajaraman, Abhay Singh, Chuili Sun, Chunyan Qu, Zuyi Huang, Yunfei Chu, Mitchell Serpas, Loveleena Bansal, Wei Dai, Shreya Maiti, Vishal Mahindrakar, Mitul Shah, Jia Kang, Travis Omer, Andrew Sinkoe, Daniel Howsmon, Sean Quinn, Troy Vargason, Kathryn Hollowood, Genevieve Grivas, Fatir Qureshi, Jennifer Ferina, Joshua Chuah, Diego Machado, Cristopher Villegas
- Post-Doc (2)
  Salvador Tututi-Avila, Ji Liu

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