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Dr. Urmila Diwekar is the President of Stochastic Research Technologies LLC and also the president of the Vishwamitra Research, a non-profit research institute that she founded to pursue multidisciplinary research in the areas of Optimization under Uncertainty and Computer-aided Design applied to Energy, Environment, and Sustainability. From 2002-2004, she was a Professor in the Departments of Chemical Engineering, Bio-Engineering, and Industrial Engineering, and in the Institute for Environmental Science and Policy, at the University of Illinois at Chicago (UIC). She has a special formal arrangement with UIC where remains as the main advisor for

her Ph.D. and M.S. students and teaches a course on optimization. From 1991-2002 she was on the faculty of the Carnegie Mellon University, with early promotions to both the Associate and the Full Professor level.

In chemical engineering, she has worked extensively in the areas of simulation, design, optimization, control, stochastic modeling, and synthesis of chemical processes. She has made major contributions to research on batch distillation, and this work is well recognized. Uncertainties are inherent in real-world processes. Recognizing this, she started working in 1991 on stochastic modeling, efficient methods for uncertainty analysis, and optimization under uncertainty. These led to productive contributions in fields as diverse as advanced power systems, sustainability, environmental management, nuclear waste disposal, molecular modeling, pollution prevention, renewable energy systems, and biomedical engineering. The interdisciplinary nature of the field developed into several research collaborations, and in 1999 she founded the Center for Uncertain Systems: Tools for Optimization and Uncertainty (CUSTOM) to foster interactions between various industries, national laboratories, and various academic disciplines. Her recent work has extended stochastic modeling and optimization of particulate processes from chemical engineering to biomedical engineering. After undergoing several IVF cycles herself, she realized the physical, economic, and emotional toll it takes on a woman to undergo this treatment. To reduce this burden, she started her work on customizing optimal dosage for each patient of IVF with minimal testing, which resulted in the decision support tool OptIVF. Early clinical trials in India showed the promise of this approach in reducing drug dosage, reducing testing, and enhancing the success of IVF. This approach is shown to reduce daily testing and the cost of medications and predict optimal custom dosages for each patient. Preparations for larger clinical trials in the United States and in Israel are now underway. The revolutionary impact of this work earned her the NESIN best researcher award in 2020 from ScienceFather



International. She is the author of more than 190 peer-reviewed research papers, and has given over 420 presentations and seminars, and has chaired numerous sessions in national and international meetings. She has been the principal advisor to 45 Ph.D. and M.S. students, and has advised 15 post-doctoral fellows and researchers. Her students have won 6 best student paper awards from various AIChE and INFORMS sections at their respective meetings.

She wrote the first book on Batch Distillation in 1994, a second edition of the book was out in 2012. Her next book was Methods and Tools for Pollution prevention, which she co-edited with Dr. S. Sikdar, Associate Director for Science at the EPA NRMRL. Her third book was on the broader, discipline independent, field of Applied Optimization (the review of the first edition in OR/MS can be found on <http://www.vri-custom.org/pdfs/book3.pdf>). Springer published the second edition of her Applied Optimization book in 2008 and the third edition is out in 2020. In 2012, along with Dr. H. Cabezas, Senior Science Advisor, Sustainable Technology Division, EPA NRMRL, she edited and contributed to Sustainability: a Multidisciplinary Perspective, which is published in 2013 as an e-book from Bentham Science Publishers. She has recently published a book on Design for Batch and Bio Processes by CRC Press. Her recent contribution is a book on BONUS algorithm for large scale stochastic nonlinear programming problem and is published by Springer. This book is nominated for 2014 INFORMS computing society award. She has also written 15 book chapters.

Besides publications, she is the author of four commercial software packages, namely, (1) BdistSimOpt, Batch Process Technologies, W. Lafayette, IN, (2) MultiBatchDS, Stochastic Research Technologies Inc., USA and Equinox Software Inc., India), (3) OptIVF, A software package for predicting optimal drug dosage customized for each patient for IVF cycles, marketed by Stochastic Research Technologies LLC., USA, and (4) SensDyn: A software package for dynamic and static sensor placement in chemical plants, power systems, water distribution network, and nutrient detection, marketed by Stochastic Research Technologies, LLC, USA. She has also served as a consultant to more than 20 companies. From 1993-94, she worked at Simulation Sciences, CA.

In 2009, she was elected a Fellow of American Institute of Chemical Engineers (AIChE). In the same year, in recognition of her work on batch distillation research for pharmaceutical industries, her work on ecological sustainability, and biomedical engineering she was also elected a Fellow of the American Institute of Medical and Biological Engineering (AIMBE). In October 2011, she received the coveted Cecil Award for Environmental Chemical Engineering from the Environmental Division of AIChE. She is the first woman to receive this national award in its 39-year history. In November 2011, she received the Thiele award for outstanding contributions to chemical engineering, awarded by the Chicago chapter of AIChE. In 2015 she received one of the most prestigious awards of AIChE (an Institute award), the Energy and Sustainability award for leadership in research related to conventional energy, renewable energy, energy-water nexus, carbon capture and environmental control for energy, pollution prevention, and sustainability. In 2017 she was invited as a plenary speaker at the international workshop on global sustainability by National Academy of Sciences,



Hungary for the Pontific academy of sciences in Rome. In 2018 she received the Clarence Gerhold award (again a national award from the separations division of AIChE) which recognizes an individual's outstanding contributions in research, development, or in application of separations technology for her pioneering work on batch distillation and green separations. For all three national awards described above, she was the first woman ever to receive the award. This unprecedented recognition attests to the broad impact of her work in so many different areas. She was also selected by Garaje Marathi as amongst the top 60 Marathi NRIs from all over the world who has contributed to enhancement of knowledge and/or society. She is also a recipient of "Jewel of LIT" award from her undergraduate regional engineering institute. In 2020, she received the best research award from ScienceFather international research awards on new science inventions (NESIN) for her work related to InVitro Fertilization. In the same year, she has been selected as a Vebleo Fellow for her contributions to science and engineering.

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Tomas R Reina, AMIChemE, FHEA, FRSC, obtained his PhD (Cum Laude) at the University of Seville (Spain) where he specialised in heterogeneous catalysis for energy applications. He has worked in several international institutions including the Brookhaven National Laboratory (NY, USA) the Institute of Chemical Engineering (Patras, Greece) and the Chemical Engineering Department at Imperial College London (UK). In 2016 he joined the University of Surrey and developed his career as Catalysis & Reaction Engineering Group Leader. Recently, he has been appointed as Profesor Titular of chemical technologies at his alma mater, the University of Seville.

His research in catalysis has been recognized by the international community with several awards including the EFCATS student award in 2013, the Spanish Society of Catalysis award in 2014, the extraordinary PhD award by the University of Seville 2014, the Young Scientist of the Year 2017 by Seville city council, the Seville Royal Academy of Sciences / Royal Cavalry Armory young research award in 2018, the Chinese Academy of Sciences President award (CAS-PIFI) 2020, the FISOCat junior award 2022 and the Losada-Villasante award 2022 for his research. He has also been finalist of the prestigious IChemE awards in 2016 and 2017 in the category of Young Academic Researcher. His research interests include the development of advanced heterogeneous catalysts and processes for energy and sustainability. In particular, Tomas' work is focused on clean hydrogen production, fuel processing technologies, carbon dioxide utilization, biomass valorization and nano/microplastics removal in water. In these fields, He has published over 160 research articles and Co-authored 7 patents.



Dr. Judy Lee

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Dr. Judy Lee received her double degree in B.Eng. (Chemical Engineering) and B.Sc (Physics) in 2002 and her PhD in 2006, both from The University of Melbourne, Australia. In 2007 She was awarded the JSPS Fellowship to spend two years in Japan at the National Institute of Advanced Industrial Science and Technology (AIST). She then returned to the Chemical Engineering Department at the University of Melbourne in 2010 as a postdoc for further two years before being awarded the DECRA (Discovery Early Career Researcher Award) by the Australian Research Council in 2012. In 2015 she took up an academic post at the University of Surrey as a Senior Lecturer and is currently an Associate Professor and Director of Learning and Teaching for the department. Her research group at Surrey is interested in both fundamental work and applied aspects of ultrasound processing and membrane filtration systems, with a particular interest in treatment of emerging pollutants such as pharmaceuticals and nano/microplastics in wastewaters.

Dr. Michael Short

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Dr Michael Short is a Lecturer in the Chemical and Process Engineering Department at the University of Surrey. His team develops mathematical models and optimisation algorithms to create decision-support software for diverse applications including energy planning, power systems, integrated process synthesis, real-time optimisation and control, and data analysis. Dr Short received his B.Sc. (2011) and Ph.D. (2017) from the University of Cape Town, before joining the Center for Advanced Process Decision-making at Carnegie Mellon University as a Postdoctoral Research Fellow. There, he led development of KIPET, an open-source Python-based software for kinetic parameter estimation from spectra, funded by Eli Lilly for use in



drug development. Michael has worked on projects involving companies such as Eli Lilly, Pfizer, Dow Chemicals, SLR, NML, and DIREK. He is the leader of the British Council-funded Trilateral Research Initiative project “A software framework for optimal decarbonisation planning for ASEAN countries”, where he has led the development of software for energy planning. Michael is a Senior Member of the AIChE, Affiliate Member of the Surrey Institute for People-Centred Artificial Intelligence, and was an Impact Acceleration Account Commercialisation Fellow.

