E. Abraham Water Systems Engineering

Research profile

Dr Edo Abraham is an Associate Professor of Water & Control Systems Engineering at Delft University of Technology, Department of Water Management. He also leads the Water Flagship of the Climate Safety & Security Centre (CaSS) @ TU Delft | Campus the Hague.

His research interests are mainly in the application of numerical optimisation, control and systems theory to advance water management and environmental engineering applications and their nexuses with energy and agricultural sectors. Some of his research deals with operational optimization of multipurpose reservoirs, optimization and control for irrigation and water allocation, optimization of cropping patterns and infrastructure assessment - most within the context of the water-energy-food nexus. Within urban water systems, his research deals with optimal control and fault diagnosis for drinking water distribution networks, and the urban nexus of heating systems, and energy transitions.

New water and energy infrastructures need to be built at unprecedented rates in the global south, especially in Sub-Saharan Africa where some of Dr Abraham's work has a special focus. His work revolves around infrastructure planning and mangaement for climate adaptation, mitigation and their spatial aspects. Dr Abraham develops decision support tools that enable better monitoring of water and energy access, infrastructure optimisation for access and their operations through close collaboration with end users. With interdisciplinary expertise in water management, energy systems, control engineering and optimization, as well as a broad collaborative network that specializes beyond these subjects, he has coordinated or has worked in transnational projects that address the water-energy-food nexus and urban water-energy systems (EPIC AFRICA, ENLARGE, PCOCS, AGRICOAST, AQUACONNECT, WATERNEXUS). In his collaborative work, Edo aims to integrate sensitivity to values and is passionate about global development that is foregrounded in values such as equitable access to resources and infrastructure, environmental sustainability, (global) solidarity and social justice.

Before joining TU Delft in 2016, Dr Abraham was a Research Associate in the Environmental and Water Resources Engineering Group at Imperial College London. He has a PhD in Control Engineering (Aeronautics) and a first-class honours MEng degree in Electrical and Electronic Engineering. He received both the MEng and PhD degrees from Imperial College London, UK, in 2008 and 2013, respectively.

Employment

Water Systems Engineering

Delft University of Technology 15 Aug 2016 → 16 Mar 2052

Research outputs

A green hydrogen revolution in Africa remains elusive under current geopolitical realities

Dagnachew, A. G., Yalew, S. G., Tesfamichael, M., Okereke, C. & Abraham, E., 2025, In: Climate Policy. 25, 2, p. 291-302 12 p.

Balancing operator's risk averseness in model predictive control for real-time reservoir flood control Koo, J-H., Abraham, E., Jonoski, A. & Solomatine, D. P., 2025, In: Journal of Hydroinformatics. 27, 4, p. 601-624 24 p.

Flood control of reservoir systems: Learning-based explicit and switched model predictive control approaches Koo, J-H., Moradvandi, A., Abraham, E., Jonoski, A. & Solomatine, D. P., 2025, In: PLOS Water. 4, 5, 31 p., e0000361.

Incorporating Risk in Operational Water Resources Management: Probabilistic Forecasting, Scenario Generation, and Optimal Control

van der Heijden, T., Mendoza-Lugo, M. A., Palensky, P., van de Giesen, N. & Abraham, E., 2025, In: Water Resources Research. 61, 3, 27 p., e2024WR037115.

Integrating Floating Photovoltaics in Long-term Energy Planning of Eastern Nile Basin Countries: Synergies Between Water Conservation, Land Use, and Emissions Reduction Abraham, E. & Pieruzzi, A., 2025. 2 p.

Model predictive control of feed rate for stabilizing and enhancing biogas production in anaerobic digestion under meteorological fluctuations

Moradvandi, A., Heegstra, S., Ceron-Chafla, P., Schutter, B. D., Abraham, E. & Lindeboom, R. E. F., 2025, In: Journal of Process Control. 147, 13 p., 103375.

Modeling changes in nutrient retention ecosystem service using the InVEST-NDR model: A case study in the Gumara River of Lake Tana Basin, Ethiopia

Abebe, W. B., Dersseh, M. G., Goshu, G., Abera, W., Abraham, E., Mekonnen, M. A., Fohrer, N., Tilahun, S. A., McClain, M. E., Payne, W. A. & Blaszczak, J. R., 2025, In: Ecohydrology & Hydrobiology. 13 p.

Optimising rainwater harvesting systems under uncertainty: A multi-objective stochastic approach with risk considerations Shefaei, A., Maleki, A., van der Hoek, J. P., van de Giesen, N. & Abraham, E., 2025, In: Resources, Conservation and Recycling Advances. 26, 14 p., 200254.

An identification algorithm of switched Box-Jenkins systems in the presence of bounded disturbances: An approach for approximating complex biological wastewater treatment models

Moradvandi, A., Abraham, E., Goudjil, A., De Schutter, B. & Lindeboom, R. E. F., 2024, In: Journal of Water Process Engineering. 60, 11 p., 105202.

Author Correction: Africa needs context-relevant evidence to shape its clean energy future

Mulugetta, Y., Sokona, Y., Trotter, P. A., Fankhauser, S., Omukuti, J., Somavilla Croxatto, L., Steffen, B., Tesfamichael, M., Abraham, E. & More Authors, 2024, In: Nature Energy. 9, 7, p. 907 1 p.

Model predictive control of purple bacteria in raceway reactors: Handling microbial competition, disturbances, and performance

Moradvandi, A., De Schutter, B., Abraham, E. & Lindeboom, R. E. F., 2024, In: Computers and Chemical Engineering. 194 , 17 p., 108981.

The Dual Model under Pressure: How Robust Is Leak Detection under Uncertainties and Model Mismatches? Campbell, E., Abraham, E., Koslowski, J., Piller, O. & Steffelbauer, D. B., 2024, In: Engineering Proceedings. 69, 1, 5 p., 89.

White Paper: Design for Justice

van de Poel, I., Secomandi, F., Abraham, E., van Uffelen, N., Feenstra, M., Liem, C., Melnyk, A., Rocco, R. & Moreno Inglés, A., 2024, Delft: Delft Design for Values Institute. 25 p.

A novel mechanistic modelling approach for microbial selection dynamics: Towards improved design and control of raceway reactors for purple bacteria

Alloul, A., Moradvandi, A., Puyol, D., Molina, R., Gardella, G., Vlaeminck, S. E., De Schutter, B., Abraham, E., Lindeboom, R. E. F. & Weissbrodt, D. G., 2023, In: Bioresource Technology. 390, 9 p., 129844.

A stochastic MPC framework for the control of pumping stations in polder systems with regard for uncertainty in inflow and hourly electricity prices

Heijden, T. V. D., Giesen, N. V. D., Palensky, P. & Abraham, E., 2023, *Proceedings of EGU General Assembly 2023, Vienna, Austria, 24-28 Apr 2023, EGU23-6203, https://doi.org/10.5194/egusphere-egu23-6203, 2023.* Vienna, Vol. EGU23-6203. 2 p. EGU 23-6203

Closed-loop simulation testing of a probabilistic DR framework for Day Ahead Market participation applied to Battery Energy Storage Systems

van der Heijden, T., Palensky, P., van de Giesen, N. & Abraham, E., 2023, 2023 IEEE 32nd International Symposium on Industrial Electronics, ISIE 2023 - Proceedings. Piscataway: IEEE, p. 1-6 6 p.

Enhancing water access monitoring through mapping multi-source usage and disaggregated geographic inequalities with machine learning and surveys

Geleijnse, J., Rutten, M., de Villiers, D., Bamwenda, J. T. & Abraham, E., 2023, In: Scientific Reports. 13, 1, 23 p., 13433.

Models and methods for hybrid system identification: a systematic survey

Moradvandi, A., Lindeboom, R. E. F., Abraham, E. & De Schutter, B., 2023, *IFAC-PapersOnLine*. Ishii, H., Ebihara, Y., Imura, J. & Yamakita, M. (eds.). 2 ed. Elsevier, p. 95-107 13 p. (IFAC-PapersOnLine; vol. 56, no. 2).

Opportunities and Challenges in the Efficient Exploiting of Land, Energy and Water Resources within the Volta and Tana Basins in Africa

Annor, F. O., Martin, V., Ofosu, E. A., Lucendo, C. G., Akuku, B., Fofana, R., Giesen, N. V. D. & Abraham, E., 2023. 1 p.

'Commoning practices' for energy justice? Perspectives on the heat transition in the city of Amsterdam

Kaandorp, C., Pessoa, I. T. M., Pesch, U., van de Giesen, N. & Abraham, E., 2023, In: Energy Research and Social Science. 108, 12 p., 103369.

A Bayesian Approach for Active Fault Isolation with an Application to Leakage Localization in Water Distribution Networks van Lagen, G., Abraham, E. & Mohajerin Esfahani, P., 2022, In: IEEE Transactions on Control Systems Technology. 31 (2023), 2, p. 761-771 11 p.

Africa needs context-relevant evidence to shape its clean energy future

Mulugetta, Y., Sokona, Y., Trotter, P. A., Fankhauser, S., Omukuti, J., Somavilla Croxatto, L., Steffen, B., Tesfamichael, M., Abraham, E. & More Authors, 2022, In: Nature Energy. 7, 11, p. 1015-1022 8 p.

Day Ahead Market price scenario generation using a Combined Quantile Regression Deep Neural Network and a Nonparametric Bayesian Network: A framework for risk-based Demand Response

van der Heijden, T., Palensky, P., van de Giesen, N. & Abraham, E., 2022, *Proceedings of the 2022 IEEE International Conference on Power Systems Technology (POWERCON).* IEEE, p. 1-5 5 p.

Emerging Themes and Future Directions of Multi-Sector Nexus Research and Implementation

Khan, Z., Abraham, E., Aggarwal, S., Ahmad Khan, M., Arguello, R., Bereslawski, J. L., Bielicki, J. M., Jewitt, G. P. W., Pande, S. & More Authors, 2022, In: Frontiers in Environmental Science. 10, p. 1-11 11 p., 918085.

Integrated assessment of renewable urban heating systems considering water use, committed emissions and energy justice

Kaandorp, C., van de Giesen, N. C. & Abraham, E., 2022. 1 p.

Multi-market demand response from pump-controlled open canal systems: an economic MPC approach to pumpscheduling

van der Heijden, T., Lugt, D., van Nooijen, R., Palensky, P. & Abraham, E., 2022, In: Journal of Hydroinformatics. 24, 4, p. 838-855 18 p.

Nonlinear model predictive control of salinity and water level in polder networks: Case study of Lissertocht catchment Aydin, B. E., Oude Essink, G. H. P., Delsman, J. R., van de Giesen, N. & Abraham, E., 2022, In: Agricultural Water Management. 264, 107502.

Pressure-Leak Duality for Leak Detection and Localization in Water Distribution Systems Steffelbauer, D. B., Deuerlein, J., Gilbert, D., Abraham, E. & Piller, O., 2022, In: Journal of Water Resources Planning and Management. 148, 3, 13 p., 04021106.

Probabilistic forecasting and scenario generation of pumped discharge in polder systems Heijden, T. V. D., Giesen, N. V. D., Palensky, P. & Abraham, E., 2022, *EGU General Assembly 2022*. Copernicus, 2 p. EGU22-6293

Reducing committed emissions of heating towards 2050: Analysis of scenarios for the insulation of buildings and the decarbonisation of electricity generation

Kaandorp, C., Miedema, T., Verhagen, J., Giesen, N. V. D. & Abraham, E., 2022, In: Applied Energy. 325, 24 p., 119759.

Decarbonising future heating systems: trade-offs between water use and CO2 emissions Kaandorp, C., van de Giesen, N. C. & Abraham, E., 2021. 1 p.

Dynamic Time Warping Clustering to Discover Socioeconomic Characteristics in Smart Water Meter Data Steffelbauer, D. B., Blokker, M., Buchberger, S. G., Knobbe, A. & Abraham, E., 2021, In: Journal of Water Resources Planning and Management. 147, 6, 12 p., 04021026.

Electricity price forecasting in European Day Ahead Markets: a greedy consideration of market integration Van der Heijden, T., Lago, J., Palensky, P. & Abraham, E., 2021, In: IEEE Access. 9, p. 119954-119966 13 p., 9524683.

Operational planning of WEF infrastructure: quantifying the value of cooperation in the Eastern Nile basin Verhagen, J., Zaag, P. V. D. & Abraham, E., 2021. 1 p.

Operational planning of WEF infrastructure: quantifying the value of information sharing and cooperation in the Eastern Nile basin

Verhagen, J., van der Zaag, P. & Abraham, E., 2021, In: Environmental Research Letters. 16, 8, 18 p., 085006.

Probabilistic DAM price forecasting using a combined Quantile Regression Deep Neural Network with less-crossing quantiles

van der Heijden, T., Palensky, P. & Abraham, E., 2021, *IECON 2021 – 47th Annual Conference of the IEEE Industrial Electronics Society: Proceedings.* IEEE, 6 p. 9589097. (IECON 2021 - 47TH ANNUAL CONFERENCE OF THE IEEE INDUSTRIAL ELECTRONICS SOCIETY).

The water use of heating pathways to 2050: analysis of national and urban energy scenarios

Kaandorp, C., Giesen, N. V. D. & Abraham, E., 2021, In: Environmental Research Letters. 16, 5, p. 1-11 11 p., 055031.

Integrative technology hubs for urban food-energy-water nexuses and cost-benefit-risk tradeoffs (I): Global trends and technology metrics

Chang, N. B., Hossain, U., Valencia, A., Qiu, J., Zheng, Q. P., Kaandorp, C., Abraham, E., ten Veldhuis, M. C., van de Giesen, N. & More Authors, 2020, In: Critical Reviews in Environmental Science and Technology. 51 (2021), 13, p. 1397-1442 46 p.

Integrative technology hubs for urban food-energy-water nexuses and cost-benefit-risk tradeoffs (II): Design strategies for urban sustainability

Chang, N. B., Hossain, U., Valencia, A., Qiu, J., Zheng, Q. P., Kaandorp, C., Abraham, E., ten Veldhuis, M. C., van de Giesen, N. & More Authors, 2020, In: Critical Reviews in Environmental Science and Technology. 51 (2021), 14, p. 1533-1583 51 p.

Managing Water Quality in Intermittent Supply Systems: The Case of Mukono Town, Uganda

Sakomoto, T., Lutaaya, M. & Abraham, E., 2020, In: Water. 12, 3, 16 p., 806.

Multi-objective model predictive control for real-time operation of a multi-reservoir system

Lin, N. M., Tian, X., Rutten, M., Abraham, E., Maestre, J. M. & van de Giesen, N., 2020, In: Water (Switzerland). 12, 7, p. 1-21 21 p., 1898.

Optimal Control for Precision Irrigation of a Large-Scale Plantation

Kassing, R. C., De Schutter, B. H. K. & Abraham, E., 2020, In: Water Resources Research. 56, 10, p. 1-22 22 p., e2019WR026989.

Smart solutions for intermittent supply systems

Abraham, E., Verbart, J. J. G. M. & van der Hoek, J. P., 2020, In: The Source – The magazine of the International Water Association. 21, p. 24-28 5 p.

Sustainable Water Resources Management in an Arid Area Using a Coupled Optimization-Simulation Modeling

Farrokhzadeh, S., Hashemi Monfared, S. A., Azizyan, G., Sardar Shahraki, A., Ertsen, M. W. & Abraham, E., 2020, In: Water. 12, 3, 26 p., 885.

The Battle of Post-Disaster Response and Restoration (BPDRR)

Paez, D., Filion, Y., Castro Gama, M. E., Santopietro, S., Sweetapple, C., Meng, F., Farmani, R., Abraham, E., Kapelan, Z. & More Authors, 2020, In: Journal of Water Resources Planning and Management. 146, 8, 13 p., 04020067.

Optimal salinity and water level control of water courses using Model Predictive Control

Aydin, B., Tian, X., Delsman, J., Oude Essink, G. H. P., Rutten, M. & Abraham, E., 1 Feb 2019, In: Environmental Modelling and Software. 112, p. 36-45 10 p.

A Heuristic Approach to Effective Sensor Placement for Salinity State Reconstruction in a Low-Lying Polder Aydin, B., Hagedooren, H. & Abraham, E., 2019. 1 p.

A Multi-Objective Approach for the Analysis of a Water-Food-Ecosystems Nexus at Basin Scale Farrokhzadeh, S., Abraham, E. & Ertsen, M., 2019. 1 p.

A greedy algorithm for optimal sensor placement to estimate salinity in polder networks

Aydin, B. E., Hagedooren, H., Rutten, M. M., Delsman, J., Essink, G. H. P. O., van de Giesen, N. & Abraham, E., 2019, In: Water (Switzerland). 11, 5, 17 p., 1101.

Demand Response from Open Canal Systems in the Dutch Delta

van der Heijden, T. J. T., Palensky, P., van Nooyen, R. R. P., Lugt, D. & Abraham, E., 2019, In: Energy Proceedings. 6, 4 p., 0439.

Identification of the methanogenesis inhibition mechanism using comparative analysis of mathematical models Odriozola, M., Abraham, E., Lousada-Ferreira, M., Spanjers, H. & van Lier, J. B., 2019, In: Frontiers in Bioengineering and Biotechnology. 7, 16 p., 93.

Maximizing Water--Food--Energy Nexus Synergies at Basin Scale

Burger, R. & Abraham, E., 2019, *Frontiers in Water-Energy-Nexus—Nature-Based Solutions, Advanced Technologies and Best Practices for Environmental Sustainability.* Naddeo, V., Balakrishnan, M. & Choo, K. H. (eds.). Cham: Springer, p. 67-70 4 p. (Advances in Science, Technology and Innovation).

Model Reduction and Outer Approximation for Optimizing the Placement of Control Valves in Complex Water Networks Pecci, F., Abraham, E. & Stoianov, I., 2019, In: Journal of Water Resources Planning and Management. 145, 5, 13 p., 04019014.

Optimising water system operations, blue storage and the green energy transition

van der Heijden, T. J. T. & Abraham, E., 2019, In: TU Delft DeltaLinks. 4 p.

Global optimality bounds for the placement of control valves in water supply networks

Pecci, F., Abraham, E. & Stoianov, I., Nov 2018, In: Optimization and Engineering. 20 (2019), p. 457-495 38 p.

Model Predictive Control of Salinity and Water Level in a Hypothetical Polder Ditch: Is it Possible to Use the Discretized Linearized Physical Equations for Optimization

Aydin, B., Rutten, M. & Abraham, E., 20 Sept 2018, *EPiC Series in Engineering: HIC 2018. 13th International Conference on Hydroinformatics*. La Loggia, G., Freni, G., Puleo, V. & De Marchis, M. (eds.). EasyChair, Vol. 3. p. 117-122 (EPiC Series in Engineering; vol. 3).

A Greedy Scheduling of Post-Disaster Response and Restoration using Pressure-Driven Models and Graph Segment Analysis Deuerlein, J., Gilbert, D., Abraham, E. & Piller, O., 15 Jul 2018, WDSA / CCWI Joint Conference 2018 . Vol. Vol 1 (2018). 14 p.

Decreasing the Discolouration Risk of Drinking Water Distribution Systems through Optimised Topological Changes and Optimal Flow Velocity Control

Abraham, E., Blokker, EJM. & Stoianov, I., Feb 2018, In: Journal of Water Resources Planning and Management. 144, 10 , 9 p., 04017093.

Penalty and relaxation methods for the optimal placement and operation of control valves in water supply networks Pecci, F., Abraham, E. & Stoianov, I., 1 May 2017, In: Computational Optimization and Applications. 67, 1, p. 201-223 23 p.

Network Analysis, Control Valve Placement and Optimal Control of Flow Velocity for Self-Cleaning Water Distribution Systems

Abraham, E., Blokker, M. & Stoianov, I., May 2017, 18th Conference on Water Distribution System Analysis: Los Andes, Colombia. Elsevier, Vol. 186. p. 576-583

Scalable Pareto set generation for multiobjective co-design problems in water distribution networks: a continuous relaxation approach Pecci, F., Abraham, E. & Stoianov, I., 1 Mar 2017, In: Structural and Multidisciplinary Optimization. 55, 3, p. 857-869 13 p.

Extending the Envelope of Demand Response Provision though Variable Speed Pumps Menke, R., Abraham, E., Parpas, P. & Stoianov, I., 2017, In: Procedia Engineering. 186, p. 584-591

Investigating trade-offs between the operating cost and green house gas emissions from water distribution systems Menke, R., Kadehjian, K., Abraham, E. & Stoianov, I., 2017, In: Sustainable Energy Technologies and Assessments. 21, p. 13-22

Iterative Multistage Method for a Large Water Network Sectorization into DMAs under Multiple Design Objectives Gilbert, D., Abraham, E., Montalvo, I. & Piller, O., 2017, In: Journal of Water Resources Planning and Management. 143, 11, 10 p.

Model Predictive Control of Salinity in a Polder Ditch under High Saline Groundwater Exfiltration Conditions: A Test Case Aydin, B., Rutten, M., Abraham, E., Oude Essink, GHP. & Delsman, J., 2017, *20h World Congress of the International Federation of Automatic Control (IFAC), 2017.* Dochain, D., Henrion, D. & Peaucelle, D. (eds.). 1 ed. Elsevier, Vol. 50. p. 3160-3164 1740. (IFAC-PapersOnline; vol. 50, no. 1).

Outer approximation methods for the solution of co-design optimisation problems in water distribution networks Pecci, F., Abraham, E. & Stoianov, I., 2017, *IFAC-PapersOnLine*. Peaucelle, D., Dochain, D. & Henrion, D. (eds.). 1 ed. Elsevier, Vol. 50. p. 5373-5379 0423. (IFAC-PapersOnLine; vol. 50, no. 1).

Quadratic head loss approximations for optimisation problems in water supply networks Pecci, F., Abraham, E. & I, S., 2017, In: Journal of Hydroinformatics. 19, 4, p. 493-506 14 p.

Smart Salinity Management in Low-lying Deltaic Areas: A Model Predictive Control Scheme Applied to a Test Canal Aydin, B., Abraham, E., Rutten, M., Delsman, J. & Oude Essink, G. H. P., 2017, In: Geophysical Research Abstracts (online). 19, 1 p., EGU2017-14448.

Exploring Optimal Pump Scheduling in Water Distribution Networks with Branch and Bound Methods Menke, R., Abraham, E., Parpas, P. & Stoianov, I., 1 Nov 2016, In: Water Resources Management. 30, 14, p. 5333-5349 17 p.

Demonstrating demand response from water distribution system through pump scheduling Menke, R., Abraham, E., Parpas, P. & Stoianov, I., 15 May 2016, In: Applied Energy. 170, p. 377-387 11 p.

A Graph-Theoretic Framework for Assessing the Resilience of Sectorised Water Distribution Networks Herrera, M., Abraham, E. & Stoianov, I., 1 Mar 2016, In: Water Resources Management. 30, 5, p. 1685-1699 15 p.

Sparse null space algorithms for hydraulic analysis of large-scale water supply networks Abraham, E. & Stoianov, I., 1 Mar 2016, In: Journal of Hydraulic Engineering (Reston). 142, 3, 04015058.

An efficient null space inexact Newton method for hydraulic simulation of water distribution networks Abraham, E. & Stoianov, I., 2016, In: ArXiv.org.

Constraint preconditioned inexact Newton method for hydraulic simulation of large-scale water distribution networks Abraham, E. & Stoianov, I., 2016, (E-pub ahead of print) In: IEEE Transactions on Control of Network Systems. p. 610-619 7463053.

Modeling Variable Speed Pumps for Optimal Pump Scheduling Menke, R., Abraham, E. & Stoianov, I., 2016, *World Environmental and Water Resources Congress 2016: Watershed Management, Irrigation and Drainage, and Water Resources Planning and Management - Papers from Sessions of the Proceedings of the 2016 World Environmental and Water Resources Congress.* American Society of Civil Engineers (ASCE), p. 199-209 11 p.

Control of water distribution networks with dynamic DMA topology using strictly feasible sequential convex programming Wright, R., Abraham, E., Parpas, P. & Stoianov, I., 1 Dec 2015, In: Water Resources Research. 51, 12, p. 9925-9941 17 p.

WaterBox: A testbed for monitoring and controlling smart water networks Kartakis, S., Abraham, E. & McCann, J. A., 13 Apr 2015, 1st ACM International Workshop on Cyber-Physical Systems for Smart Water Networks, CySWater 2015. ACM, 8

Lower-order H_∞ filter design for bilinear systems with bounded inputs Abraham, E. & Kerrigan, E. C., 15 Feb 2015, In: IEEE Transactions on Signal Processing. 63, 4, p. 895-906 12 p., 6996039.

Approximation of system components for pump scheduling optimisation Menke, R., Abraham, E., Parpas, P. & Stoianov, I., 2015, In: Procedia Engineering. 119, 1, p. 1059-1068 10 p.

Efficient preconditioned iterative methods for hydraulic simulation of large scale water distribution networks Abraham, E. & Stoianov, I., 2015, In: Procedia Engineering. 119, 1, p. 623-632 10 p.

Graph-theoretic surrogate measures for analysing the resilience of water distribution networks Herrera, M., Abraham, E. & Stoianov, I., 2015, In: Procedia Engineering. 119, 1, p. 1241-1248 8 p.

Mathematical programming methods for pressure management in water distribution systems Pecci, F., Abraham, E. & Stoianov, I., 2015, In: Procedia Engineering. 119, 1, p. 937-946 10 p.

Optimized control of pressure reducing valves in water distribution networks with dynamic topology Wright, R., Abraham, E., Parpas, P. & Stoianov, I., 2015, In: Procedia Engineering. 119, 1, p. 1003-1011 9 p.

Estimator design for input-constrained bilinear systems with application to wave energy conversion Abraham, E. & Kerrigan, E. C., 2013, *2013 IEEE 52nd Annual Conference on Decision and Control, CDC 2013.* IEEE, p. 5686-5691 6 p. 6760785. (Proceedings of the IEEE Conference on Decision and Control).

Optimal active control and optimization of a wave energy converter Abraham, E. & Kerrigan, E. C., 2013, In: IEEE Transactions on Sustainable Energy. 4, 2, p. 324-332 9 p., 6353624. Optimal active control of a wave energy converter Abraham, E. & Kerrigan, E. C., 2012, *51st IEEE Conference on Decision and Control.* p. 2415-2420

Activities

Journal of Hydroinformatics (Journal) E. Abraham (Editor) 2022 → ...

Environmental Research Letters (Journal)

E. Abraham (Editor), Edward Byers (Editor), simon parkinson (Editor) & Zarrar Khan (Editor) Oct 2020 → Jan 2021

Multi-scale water-energy-land nexus planning to manage socio-economic, climatic, and technological change (Session Convener at EGU 2019) E. Abraham (Contributor) 7 May 2020

Energy Systems (Journal) E. Abraham (Editor)

2020 → ...

Water (Journal) Simon Parkinson (Editor), Edward Byers (Editor) & E. Abraham (Editor) Jul 2019 → Mar 2020

EGU General Assembly 2019

Edo Abraham (Member of programme committee) 10 Apr 2019

1st IFAC workshop on Control Methods for Water Resource Systems (Event) Edo Abraham (Chair) Jan 2019 → Sept 2019

Maximizing water-food-energy nexus synergies at Basin Scale E. Abraham (Speaker) 15 Nov 2018

Energy Systems (Journal) E. Abraham (Editorial board member) Aug 2018 → ...

IEEE (External organisation)

E. Abraham (Member) Feb 2018 → Mar 2018

IEEE Conference on Control Technology and Applications (Event) E. Abraham (Editor) Mar 2017 → Jul 2017

Drinking Water Engineering and Science (Journal)

E. Abraham (Editor) 19 Jan 2017 → 30 Jun 2017 Sustainable Management of Water Distribution Systems Using Model-based Optimization Tools and Renewable Energy E. Abraham (Speaker) 16 Jan 2017 → 17 Jan 2017

ICA 2017 (Event) E. Abraham (Member) Jan 2017 → Jun 2017

ICA 2017 (Event) E. Abraham (Member) 2017

Prizes

First Place Award for outstanding achievements in The Battle of the Leakage Detection and Isolation Methods (BattleDIM) 2020

Steffelbauer, D.B. (Recipient), Deuerlein, Jochen (Recipient), Gilbert, Denis (Recipient), Piller, Olivier (Recipient) & Abraham, E. (Recipient), 3 Sept 2020

Press/Media

Balancing water, food and energy to drive sustainable development E. Abraham 31/01/23 1 item of Media coverage

Digitale transformatie werpt vruchten af voor de watersector

E. Abraham 29/03/21 1 item of Media coverage

Doris van Halem in de media 2023 D. van Halem, E. Abraham & G.C.M. Wiersma $14/03/23 \rightarrow 26/08/23$ 3 Media contributions

Enlarge the focus.

C. Kaandorp, E. Abraham & I. Tempels Moreno Pessôa 17/09/21 1 Media contribution

Project results from ENLARGE pave the way for sustainable urban heating, tailored to neighbourhood needs without compromising energy resilience or social justice E. Abraham 16/05/22 1 Media contribution

Vergroot de focus C. Kaandorp, E. Abraham & I. Tempels Moreno Pessôa 3/12/20 1 Media contribution

You should know this about the 700 agreements at the UN Water Conference of the Netherlands and Tajikistan E. Abraham

31/03/23 1 item of Media coverage

Datasets/Software

Data for the paper: Optimal Control for Precision Irrigation of a Large-Scale Plantation Kassing, R. C. (Creator) & Abraham, E. (Creator), TU Delft - 4TU.ResearchData, 6 Jan 2020 DOI: 10.4121/UUID:4FB3A35F-1786-45EE-A2F8-65A391FA86D0

Multi-scale water and energy use model: Workbook accompanying the paper 'The water use of heating pathways to 2050: analysis of national and urban energy scenarios'.

Kaandorp, C. (Creator), van de Giesen, N. C. (Creator) & Abraham, E. (Creator), TU Delft - 4TU.ResearchData, 14 Mar 2023

DOI: 10.4121/22257079