



12th IWA Specialized Conference on Instrumentation, Control & Automation

**Québec City, Québec, Canada
11-14 June 2017**

**Conference
Program**



Message from the Conference Chairs

Exactly ten years ago the chairs of this ICA2017 conference were very proud to acquire their first water quality sensors from one of the ICA2017 sponsors. We've come a long way...



On behalf of the Scientific and Organizing Committees it gives us great pleasure to welcome you, delegates, to the 12th IWA Specialized Conference on Instrumentation, Control and Automation, ICA2017.

We received a strongly positive response to ICA2017 from near and far with registrations from over 100 organizations representing over 30 countries. The combination of valuable workshops, utility/municipality/consultant/academic forums, exceptional keynote speakers, and quality oral and poster presentations will ensure a high-calibre conference.

We want to acknowledge the behind-the-scenes work of our Scientific Committee, whose energy and commitment have been integral to holding an internationally-recognized event such as this. A special word of thanks also to the model *EAU* organizing committee (see next page) that relentlessly worked on making it all happen. We are also delighted to have a solid level of support from our sponsors. Without this support, this conference would not have been possible.

We encourage you to actively participate in both the technical and social activities at ICA2017. We look forward to meeting you at the various networking opportunities scheduled throughout the Conference to enable our diverse community to share ideas and discover new opportunities through collaboration. At these sessions you will also have the opportunity to sample what our magnificent location has to offer in terms of climate, environment, gastronomy and warm hospitality.

We wish you all an enjoyable stay in Québec City, and a productive and inspiring conference. We look forward to catching up with you over the following days.

A handwritten signature in blue ink, appearing to read 'Peter A. Vanrolleghem'.

Peter A. Vanrolleghem
Université Laval

A handwritten signature in blue ink, appearing to read 'Leiv Rieger'.

Leiv Rieger
inCTRL Solutions Inc.

Organizing committee



Maxine Dandois-Fafard



Cyril Garneau



Gamze Kirim



Sylvie Leduc



Thomas Maere



Romain Philippe



Queralt Plana



Sovanna Tik



Elena Torfs

Practical information

Conference Venue

The conference will take place at [three different locations](#):

- Saturday workshops will be held on the campus of **Université Laval** at **Pavillon La Laurentienne**
Address: [1030 avenue du Séminaire, Québec, QC, G1V 0A6](#)
- From Sunday to Wednesday, activities will take place at the **Québec City Convention Center**
Address: [900 Avenue Honoré-Mercier, Québec, QC, G1A 1B4](#)
- The Welcome Reception/Icebreaker activities on Sunday evening will take place at **Musée de la Civilisation**, at about 25-min walk (1.6 km) from the Convention Center and the shortest path gets you into the beautiful Old City of Québec. Buses (optional) will be organized: departure at 4:30PM at the entrance 900 Av. Honoré-Mercier.
Address: [27 Rue Notre Dame, Québec, QC, G1K 4E9](#)



Registration

Our registration desk will be open according to the following schedule:

- Université Laval – workshop rooms
Saturday, from 8AM – 9:30AM, for participants of the workshops
- Musée de civilisation – entrance
Sunday, from 4PM – 6PM, during the welcome reception
- Québec City Convention Center – entrance
Sunday, from 7:30AM – 10:30AM
Monday, from 8AM – 10:30AM
Tuesday, from 8AM – 9AM
Wednesday, from 8AM – 9AM & 4PM – 4:30PM

Meals and Coffee Breaks

Lunch and **coffee breaks** are included in the registration fees from **Sunday 11th to Wednesday 14th**. Meals will be served at different locations in the Convention Center, please refer to the detailed program below. If you have any dietary requests and/or allergies, please make sure to confirm upon registration that we got the right information.

Dinners on Monday and Tuesday are on your own. A “foodie tour” (“Parcours épicurien” in French) has been exclusively organized for conference attendees and accompanying persons (more info: <http://ica2017.org/social-program>).

The **Conference Gala Dinner** will be held on **Wednesday, June 14th**. This event is included in the registration fee for all conference participants. Extra gala dinner tickets for accompanying persons will be available for purchase from the registration desk until Sunday evening. Buses providing transportation to the surprise Conference Gala Dinner location will leave from the Convention Center between 4:30PM and 4:45PM. **Make sure to be on time for the busses or you will miss the Conference Gala Dinner.** Buses will return guests from the Gala to the Convention Center at 10:30PM and 11:30PM.

NB: A warm coat is recommended to fully enjoy sight-seeing till late...

Transportation

Université Laval and the Québec City Convention Center can be reached by many bus lines. The most frequent and reliable are lines 800 and 801 (see rtcquebec.ca).

Quebec City is quite car-friendly, but parking space at both locations can be expensive.

The most convenient transportation from the airport is by taxi. A flat rate of 34.25\$ is charged from the airport to the city. It is customary, in Québec, to offer a 15% tip.

Internet Services

The Université Laval Campus free WIFI network is “**Wi-Fi_UL**”. No password is needed, simply connect, open your browser, and accept the conditions of use. Eduroam is also available throughout campus.

At the Québec City Convention Center, a free WIFI network is available with a daily limit of 300MB per device.

Weather Forecast

A Québec spring weather is forecast for the week, with maximum temperatures around 20-25°C and an occasional shower.

Conference Information

Poster Sessions & Competition

The ICA2017 Scientific Committee has selected a high-quality set of submissions for Poster Presentation at the conference. The posters will be located in the *Espace Urbain*. You will quickly learn that we've made extensive efforts to draw the participants to the dedicated poster sessions on **Monday between 5:00PM and 6:30PM** and on **Tuesday between 5:00PM-7:00PM**. A poster competition will be held, and the **Poster Award** winner will be celebrated during the closing ceremony.

Note to all poster presenters: Poster panels are vertical, with Velcro mounting material available in the poster area from Sunday after lunch until 4:30PM when the bus leaves for the Welcome Reception. Your designated poster panel locations have been grouped thematically and are indicated on the panels.

Parallel Session

Oral presentations in the two parallel sessions are each 20 minutes long. All presentations in a given session will be followed by a 5 minute direct question period, but 15 minutes will be reserved in the session for a general discussion period, at the end of each session. The objective is to lift the discussion beyond the technical detail of a single paper, and get answers on the bigger picture of the session's theme. Session moderators will help facilitate all discussions.

Note to all presenters: Please come to the session room early to get in contact with your chairs, discuss your short bio and test your presentation on the session computer. A member of the Organizing Committee will be available to help out if necessary.

Conference Proceedings

A paper copy of the proceedings will be given with the conference bag to those that have indicated this upon registration. The proceedings are also available [online](#) in PDF format. The password will be sent to all conference attendees by email.

Saturday – June 10

YWP workshop: *ICA today: exploring advances, challenges and synergies from multiple perspectives*

Location: Université Laval, Pavillon La Laurentienne – Room 1334

8:45 – 9:15

Welcome and ice breaker

9:15 – 10:00

Keynote: “Instrumentation, Control and Automation in the Global Water Industry: trends and challenges”

Eveline Volcke, Ghent University, Chair of the IWA specialist group on the ICA

10:00 – 10:30

Coffee break

10:30 – 12:15

Discussion sessions: “Emerging challenges and technologies in ICA domain”

10:30 – 10:35 Introduction

10:35 – 11:25 Session 1 (topic choice 1)

11:25 – 12:15 Session 2 (topic choice 2)

Topic 1: *Sensors and instrumentation - Thomas Maere and Cyril Garneau, Université Laval*

Topic 2: *Data Treatment - Janelcy Alferes, Suez Environment*

Topic 3: *Boundaries of Conventional PID Control & Beyond - Stephanie Klaus and Ali Gagnon, Hampton Roads Sanitation District*

Topic 4: *Université Laval Pilot Plant Visit*

12:15 – 13:45

Lunch

13:45 – 15:30

ICA Case-studies

Participants work together in small groups to find solutions to one out of three different case-studies.

13:45 – 14:00

Introduction

14:00 – 15:00

Discussion

15:00 – 15:30

Wrap-up

Case Study 1: *Reducing Non-Revenue Water Loss*

Facilitator: *Ken Thompson, CH2M*

Case Study 2: *Energy Reduction at a WRRF*

Facilitator: *Lina Belia, Primodal*

Case Study 3: *BNR Stability at a WRRF*

Facilitator: *Adrienne Menniti, Clean Water Services*

15:30 – 16:00

Coffee break

16:00 – 17:00

Expert panel: Opportunities and Outlooks in ICA (questions prepared by YWPs)

(Lina Belia – Primodal, Adrienne Menniti – Clean Water Services, Gustaf Olsson – Lund University, Rob Smith - YSI, Ken Thompson - CH2M)

17:00 – 19:00

Social activity: Drinks @University Pub

Saturday – June 10

Workshop: *Spectrophotometry for monitoring of the urban water cycle*

Location: Université Laval, Pavillon La Laurentienne – Room 1415

8:45 – 9:00	Welcome / Introduction round <i>Kris Villez (Eawag, Switzerland)</i>
9:00 – 9:30	Spectrophotometry: A gentle introduction <i>Kris Villez (Eawag, Switzerland)</i>
9:30 – 10:00	Opportunities and challenges of spectrophotometry in the water industry: field experiences using UV/Vis sensors in on-line monitoring of water systems <i>Janelcy Alferes (Suez, France)</i>
10:00 – 10:30	Coffee break
10:30 – 11:00	Latest developments <i>Andreas Weingartner (s::can Messtechnik GmbH, Austria)</i>
11:00 – 11:30	The use of UV-VIS spectrometer probes to estimate additional loads drained by the central storage tunnel Graz to the WWTP Graz, Austria <i>Günter Gruber (TU Graz, Austria)</i>
11:30 – 12:15	Discussion
12:15 – 13:45	Lunch

13:45 – 14:10	IR and online UV-vis for VFA and algae monitoring <i>Gerardo Muñoz Montoya (Universidad Nacional Autónoma de México, México)</i>
14:10 – 15:05	UV-vis spectrophotometry for wastewater resource recovery with algae bioreactors Borja Valverde Pérez (DTU, Denmark)
15:05 – 15:30	Spectrophotometry in high strength wastewater treatment: Tracking the sensor state & observation of relevant backscattering effects <i>Christian Thürlimann (Eawag, Switzerland)</i>
15:30 – 16:00	Coffee break
16:00 – 16:30	Infrared spectroscopy and modelling for optimization of anaerobic digesters <i>Jean-Philippe Steyer (INRA-LBE, France)</i>
16:30 – 17:00	Open discussion – Issues – Opportunities – Actions – Collaborations

Sunday – June 11

Location: Québec City Convention Center

Manufacturer Forum (Room 307A)

Chairs: Andreas Weingartner (*s-can Messtechnik, Austria*)
 Xin Gao (*Grundfos Holding A/S, Singapore*)
 Tom DeLaura (*DeLaura Consulting, MI, United States*)

Utility Forum (Room 308B)

Chairs: Pernille Ingildsen (*Kalundborg Utility, Denmark*)
 Christine de Barbadillo (*DC Water, Washington DC, United States*)
 Elkin Hernandez (*DC Water, Washington DC, United States*)

Consultants Forum (Room 307B)

Chairs: Oliver Schraa (*inCTRL Solutions, ON, Canada*)
 Phill Yi (*Hazen, VA, United States*)

Academic Forum (Room 308A)

Chairs: Eveline Volcke (*Ghent University, Belgium*)
 Jean-Philippe Steyer (*INRA-LBE, France*)

Sunday June 11th- Daily Schedule

8:00 – 8:30	Morning coffee (Espace Urbain)
8:30 – 8:45	Welcome by the conference chairs Peter A. Vanrolleghem and Leiv Rieger
8:45 – 10:00	Forum discussions
10:00 – 10:30	Coffee break (Espace Urbain)
10:30 – 12:00	Forum discussions
12:00 – 13:00	Lunch (Hall Vidéotron)
13:00 – 14:30	Forum discussions
14:30 – 15:00	Coffee break (Espace Urbain)
15:00 – 16:00	Forum discussions
16:30	Bus departure (optional) to Welcoming Reception from entrance <i>900 Av. Honoré-Mercier.</i>
17:00	Icebreaker Welcome and Keynote "Looking at ICA in water through a power engineering lens" by Gustaf Olsson followed by a guided tour of the museum (Musée de la Civilisation)

Monday – June 12		
8:30	Opening Session – Keynote “ICA and optimization in sewer, WRRF and river at Waterschap De Dommel – A strategic decision with impact on several fronts” by Stefan Weijers (Room 306A)	
10:00	Coffee break (Espace Urbain)	
10:30	Method – Fault Detection I (Room 307)	WRR – Control of Anaerobic Treatment (R. 308)
	<i>Moderators: Robert Smith and Sovanna Tik</i>	<i>Moderators: Yanchen Liu and Sofiane Mazeghrane</i>
	Experimental design for data validation by application of linear data reconciliation to wwtp data. <i>Quan Le, Ghent University, Belgium</i>	Adaptive feedback linearizing control of the anaerobic digestion process. <i>Lenin Núñez Pintado, Universidad de Piura, Peru</i>
	Monitoring fouling on dissolved oxygen sensors in WRRFs with active fault detection. <i>Oscar Samuelsson, IVL Swedish Environmental Research Institute, Sweden</i>	ICA applied to membrane anaerobic co-digester for wastewater nutrient and biogas recovery. <i>Juan Francisco Mora, Universitat Politècnica de València - IIAMA, Spain</i>
	Observing the observer: Monitoring pH sensors by means of step response experiments. <i>Kris Villez, Eawag, Switzerland</i>	Optimizing the operational/control conditions of a full-scale industrial granular anaerobic digester. <i>Xavier Flores-Alsina, DTU, Denmark</i>
12:00	Lunch (Room 306B)	

13:30	Method – Data Analytics (Room 307)	WRR – Control to Mitigate GHG Emissions (R. 308)
	<i>Moderators: Kris Villez and Phill Yi</i>	<i>Moderators: Janelcy Alferes and Miguel Mauricio-Iglesias</i>
	datEAUbase: Water quality database for raw and validated data with emphasis on structured metadata. <i>Queralt Plana, Université Laval, Canada</i>	Simple control strategies for mitigating N₂O emissions in phase isolated full-scale WWTPs. <i>Borja Valverde-Pérez, DTU, Denmark</i>
	Data cleaning, warehouse and mining for operation optimization in wastewater treatment plants in China. <i>Yong Qiu, Tsinghua University, China</i>	On line monitoring, control and mitigation of greenhouse gases emissions in WWTPs. <i>Juan Baeza, Universitat Autònoma Barcelona, Spain</i>
	Using a unified data platform and analytics toolbox for data management and process optimization at Kansas River WWTP. <i>Kelly Martin, Black & Veatch, United States</i>	Continuous aeration control in a full-scale DEMON™ reactor to reduce N₂O emissions. <i>Nerea Uri Carreño, VandCenter Syd, Denmark</i>
15:00	Coffee break (Espace Urbain)	
15:30	Forum Reports and Discussions (Room 306A) <i>Moderator: Leiv Rieger</i> <ul style="list-style-type: none"> Manufacturer Forum Summary Utility Forum Summary Consultant Forum Summary Academic Forum Summary 	
17:00	Poster Session I and Cocktail (Espace Urbain)	
18:30	ICA Specialist Group – Open Session (Room 307)	
19:00	Evening free. Consider the “Foodie Tour” activity (see http://ica2017.org/social-program)	

Tuesday – June 13

8:30	Method – Soft Sensors (Room 307)	WRR – Ammonia-Based Aeration Control - Case Studies (Room 308)
	<i>Moderators: Doug Lumley and Thomas Maere</i>	<i>Moderators: John Ludwig and Angel Robles</i>
	Soft-sensing nitrite in a urine nitrification system for resource recovery. <i>Kris Villez, Eawag, Switzerland</i>	Full-scale demonstration of novel nitrification control system with feed-forward and feedback control. <i>Yoshinori Nishida, Hitachi, Ltd. Research & Development Group, Japan</i>
	Predicting influent PO₄ using a multivariate soft sensor. <i>Ivan Miletic, inCTRL Solutions Inc., Canada</i>	Case studies of ammonia based aeration control at multiple advanced water resource recovery facilities. <i>Phill Yi, Hazen and Sawyer, United States</i>
	Advanced on-line monitoring at wastewater treatment plants: Coupling e-nose technology and modelling. <i>Janelcy Alferes, Cirsee - Suez, France</i>	Utilizing in-situ nutrient sensors and feedback PID controllers to implement and operate ammonia-based aeration control. <i>Kshitiz Uprety, HRSD, United States</i>
10:00	Coffee break (Espace Urbain)	

10:30	Method – Process Monitoring (Room 307)	WRR – Ammonia-Based Aeration Control - Challenges and Solutions (Room 308)
	<i>Moderators: Robert Smith and Jorge Santos</i>	<i>Moderators: Juan Antonio Baeza and Tri Le</i>
	Development and validation of a novel monitoring system for batch flocculant solids settling process. <i>Borja Valverde-Pérez, DTU, Denmark</i>	Anti-windup design for supervisory ammonium controllers in nitrifying activated sludge processes. <i>Bengt Carlsson, Uppsala University, Sweden</i>
	A simplified approach for activity monitoring in complex wastewater treatment processes. <i>Miguel Mauricio-Iglesias, Universidade de Santiago de Compostela, Spain</i>	Achieving simultaneous nitrification denitrification in ammonia based aeration control. <i>Stephanie Klaus, Virginia Tech, United States</i>
	Prediction of performances and optimization of anaerobic digesters through near infrared spectroscopy and modeling. <i>Jean-Philippe Steyer, INRA, France</i>	Ammonia-based aeration control with optimal SRT control: improved performance and lower energy consumption. <i>Oliver Schraa, inCTRL Solutions Inc., Canada</i>
12:00	Lunch (Room 306B)	

13:30	Method – Fault Detection II (Room 307)	WRR – Control of Sedimentation (Room 308)
	<i>Moderators: Yanchen Liu and Oscar Samuelsson</i>	<i>Moderators: Doug Lumley and Elena Torfs</i>
	Failure prediction of multimedia filters by using a hybrid clustering method. <i>Ryu Suzuki, University of Cincinnati, United States</i>	Control of chemically enhanced primary treatment based on microsieving. <i>Janne Väänänen, Lund University, Sweden</i>
	Data validation and gross error detection in monitoring wastewater treatment process – application to a SHARON reactor. <i>Eveline Volcke, Ghent University, Belgium</i>	Return activated sludge flow control and sludge settling properties at Henriksdal WWTP. <i>Christer Laurell, Stockholm Vatten, Sweden</i>
	Validating data quality for water quality monitoring: Objective comparison of three data quality assessment approaches. <i>Janelcy Alferes, modelEAU, Canada</i>	Balancing the sludge blanket and flow distribution in final settlers secures stable operation and max hydraulic capacity. <i>Henrik A. Rønnow Thomsen, Krüger A/S, Denmark</i>
15:00	Coffee break (Espace Urbain)	

15:30	Method – Data Replacement (Room 307)	WRR – Novel Control Concepts (Room 308)
	<i>Moderators: Janelcy Alferes and Queralta Plana</i>	<i>Moderators: Xin Gao and Pau Juan Garcia</i>
	A stochastic method to manage delay and missing values for in-situ sensors in an alternating activated sludge process. <i>Peter Stentoft, DTU, Denmark</i>	Qualitative control for stable and efficient urine nitrification. <i>Christian Thürlimann, Eawag, Switzerland</i>
	Improved on-line simulations of wastewater treatment plants using time series methods. <i>Ivan Miletic, inCTRL Solutions Inc., Canada</i>	Wastewater disinfection by peracids: Advanced dose control technology validation with pilot and modeling studies. <i>Domenico Santoro, Trojan Technologies, Canada</i>
16:30	YWP Report and Short Wrap-up (Room 306A) – Poster Session II and Cocktail (Espace Urbain)	
19:00	Evening free. Consider the “Foodie Tour” activity (see http://ica2017.org/social-program)	

Wednesday – June 14

8:30	WRR – Models for Aeration Control (Room 307)	Sewer – Monitoring (Room 308)
	<i>Moderators: Pernille Ingildsen and Kshitiz Uprety</i>	<i>Moderators: Xin Gao and Simon Weru</i>
	Control strategies using dynamic alpha factors for oxygen transfer optimization in WRRFs. <i>Manel Garrido-Baserba, University of California, Irvine, United States</i>	Highly distributed long-term monitoring of in-sewer dynamics using low-power radio technology. <i>Frank Blumensaat, Institute of Environmental Engineering, ETH Zurich / Swiss Federal Institute of Aquatic Science and Technology, Eawag, Switzerland</i>
	Exploring the potential of dynamic aeration models to evaluate control strategies: the experience at the Girona WRRF. <i>Pau Juan-García, Atkins UK, United Kingdom</i>	A preliminary study of real-time monitoring and control of biofilters for stormwater harvesting. <i>Pengfei Shen, Monash University, Australia</i>
	Advanced control system based on pH, ORP and DO sensors for optimisation of full-scale WWTPs. <i>Ángel Robles, Universitat de València, Spain</i>	Identifying industrial wastewaters discharged to sewers from UV-Vis spectroscopy data. <i>Yanchen Liu, School of Environment, Tsinghua University, China</i>
10:00	Coffee break (Espace Urbain)	

10:30	Instrumentation – Principles (Room 307)	Sewer – Control (Room 308)
	<i>Moderators: Kris Villez and Gamze Kirim</i>	<i>Moderators: Dirk Muschalla and Cyril Garneau</i>
	Nitric oxide production interferes with aqueous dissolved oxygen sensors. <i>Stephanie Klaus, Virginia Tech, United States</i>	Online control of chemical dosing in sewers for sulfide abatement. <i>Zhiguo Yuan, The University of Queensland, Australia</i>
	Experiences from using acoustic soft sensors in wastewater treatment – results from pilot studies. <i>Linda Åmand, IVL Swedish Environmental Research Institute, Sweden</i>	Reinforcement learning-based control of storm water networks. <i>Abhiram Mullapudi, University of Michigan, United States</i>
	Inline VFA monitoring using a mid-infrared spectroscopy based sensor: Validation in lab-scale and full-scale AD reactors. <i>Henri Spanjers, Delft University of Technology, Netherlands</i>	An efficient formulation of overflow structures for Model Predictive Control of urban drainage systems. <i>Rasmus Halvgaard, DHI, Denmark</i>
12:00	Lunch (Room 306B)	

13:30	Instrumentation – Operation (Room 307)	Sewer / WRR – Integrated Control (Room 308)
	<i>Moderators: John Ludwig and Nataliia Sivchenko</i>	<i>Moderators: Dirk Muschalla and Congcong Sun</i>
	Instrumentation at Swedish WWTPs – a survey and interview study. <i>Linda Åmand, IVL Swedish Environmental Research Institute, Sweden</i>	Local water-level-driven the discrete control for sewer- WWTP integrated optimization operation. <i>Yanchen Liu, School of Environment, Tsinghua University, China</i>
	One utility's approach to evaluating new instrumentation and ongoing maintenance and validation. <i>Adrienne Menniti, Clean Water Services, United States</i>	Coordinated control of collection systems using market-based optimization to maximize performance. <i>Bryant McDonnell, EmNet LLC, United States</i>
	Sensor location in WRRFs: easy change, big win. <i>Ingmar Nopens, Ghent University, Belgium</i>	Experiences using the dynamic volume in a sewer network to optimize the wastewater treatment plant and sewer network. <i>Troels Poulsen, Kruger A/S, Denmark</i>
15:00	Coffee break (Espace Urbain)	
15:30	Closing Session – Keynote “Dealing with full-scale monitoring and control issues” by Maureen O’Shaughnessy (Room 306A)	
16:00	Free time. Dressing-up time for Conference Gala Dinner!	
16:45	Bus departure to Conference Dinner (Entrance 900 Av. Honoré-Mercier)	

Thursday – June 15

7:45 – 9:45

Optional Technical Tour (Québec City Sewer RTC and Water Resource Recovery Facility)

Free tour – need to register separately

The tour will explore the combined sewer system of the city of Quebec. It will discuss (1) the wastewater treatment facility with focus on measurement and control aspects and (2) the sewer system and its global real-time control system. The global control system was developed to deal with storm impacts and to reduce combined sewer overflows. Also at the treatment plant the main control issues are to deal with wet weather overloads.

Bus departure at 7:45 at the 900 Av. Honoré-Mercier entrance.

Poster presentations (Espace Urbain)

Instrumentation, Monitoring and Network

Cofactor F430 in AnMBRs: a potential biomarker for methanogenic activity? *Ilse Smets, KU Leuven, Belgium.*

On-line filterability measurements in anaerobic membrane bioreactors. *Magela Odriozola Arbiza, Delft University of Technology, Netherlands.*

Long-term behavior of fibre optic sodium optodes with a comparison with sodium electrodes. *Serge Caron, INO, Canada.*

On-line monitoring of a microbial electrolysis cell using a simple electrical equivalent circuit model. *Azfar Hussain Syed, National Research Council, Canada.*

Soft sensor application for real-time monitoring of a Norwegian wastewater treatment plant. *Xiaodong Wang, Norwegian University of Life Sciences, Norway.*

Data-driven status diagnosis of sewerage system operation. *Yanchen Liu, Tsinghua University, China.*

Evaluation of rainfall-derived inflow and infiltration based on wastewater quality and quantity in sewerage system. *Yanchen Liu, State Key Joint Laboratory of Environment Simulation and Pollution Control, School of Environment, Tsinghua University, China.*

Novel, non-intrusive microwave sensors for water analysis. *Vasiliki Koutsospyrou, Loughborough University, United Kingdom.*

Turning passive data into knowledge - a review of wastewater treatment monitoring methods. *Lluís Corominas, ICRA, Spain.*

Flow prediction for urban drainage system real time control using artificial neural network: A case in Kunming City. *Huang Senchen, Tsinghua University, China.*

In-situ UV-Vis probe to monitor algal photobioreactors treating municipal wastewater. *Borja Valverde-Pérez, DTU, Denmark.*

Hybrid linear observer for an activated sludge process with alternate phases. *Christian Feudjio, Université de Mons, Belgium.*

Crossflow filtering of fluids is a must for enhanced use of spectrometers. *Vincent Lopata, Aquatic Life Limited, Canada.*

Spectral sensors shine light on nitrite accumulation. *Robert Smith, YSI / Xylem, United States.*

Observability issues and unknown inputs in microalgae cultures. *Christian Feudjio, Université de Mons, Belgium.*

Modelling for Control

Non-linear modelling of the dissolved oxygen to ammonium dynamics in a nitrifying activated sludge process. *Bengt Carlsson, Uppsala University, Sweden.*

Modelling ammonia based aeration control in real time with online instrumentation. *Bob Dabkowski, Hach, United States.*

Experience from implementing automatic dosage of coagulant at four drinking water plants. *Oscar Samuelsson, IVL Swedish Environmental Research Institute, Sweden.*

Utilizing dynamic simulation to optimize controls and reduce risk. *Matt Deavenport, CH2M, United States.*

Benchmarking of control strategies implemented in a dedicated control platform for wastewater treatment processes. *María Victoria Ruano, Universitat de València, Spain.*

The META-ASM model: validation in full-scale WWTPs and performance comparison with ASM2d, *Jorge Santos, Universidade NOVA de Lisboa, Portugal.*

Field scale test bed development of integrated storm water runoff management system for urban river water quality management. *Dongil Seo, Chungnam National University, Republic of Korea.*

Model-based evaluation of nutrient and energy recovery control strategies in wastewater treatment systems. *Kimberly Solon, Lund University, Sweden.*

Conceptual quality modelling and integrated control of combined urban drainage system. *Congcong Sun, Institut de Robòtica i Informàtica, Spain.*

Towards a domain-based framework for use of rainfall forecasts in control of integrated urban wastewater systems. *Luca Vezzaro, DTU, Denmark.*

Control and Optimization

Simulation of alternative temperature control structures of a biogas reactor in a wastewater treatment plant. *Shadi Attar, University College of Southeast Norway, Norway.*

Controlling biogas desulfurization in aerobic biotrickling filters through trickling liquid velocity regulation. *Juan Baeza, Universitat Autònoma Barcelona, Spain.*

Autonomous process control algorithms for optimum filtration. *Dominik Dominiak, Grundfos Holding A/S, Denmark.*

Robustness evaluation of control strategy for activated sludge system with simultaneous nitrogen and phosphorus removal. *Huang Senchen, Tsinghua University, China.*

Optimization of the microbiological population using precise sludge age (srt) control. *Alexander Ekster, Ekster and Associates, United States.*

MPC and PI control of the level of the inlet basin of a wastewater treatment plant. *Finn Haugen, University College of Southeast Norway, Norway.*

Advanced process control - meet the future treatment needs in existing SBRs. *Linda Åmand, Xylem Inc, Sweden.*

Developing real-time decision support systems for improved control of stormwater and wastewater infrastructure. *Luis Montestruque, EmNet, LLC, United States.*

Obtaining nitrogen discharge using online control for mainstream deammonification coupled with partial denitrification. *Tri Le, The Catholic University of America, United States.*

Towards smart CSO control in Gothenburg - balance between recipients, plant loading and operational safety. *Douglas Lumley, Gryaab AB, Sweden.*

A neural network based predictive controller for wastewater treatment process. *Abhilash Nair, Norwegian University of Life Science, Norway.*

Simplified control of rotating disks and effluent weir in Orbal ditch by feedforward-feedback strategy. *Yong Qiu, Tsinghua University, China.*

ICA of an anaerobic MBR (AnMBR) industrial prototype plant for urban wastewater treatment. *Ángel Robles, Universitat de València, Spain.*

Full scale experience with standby control of continuous activated sludge lines for energy savings. *Henrik Thomsen, Krüger A/S, Denmark.*

PHA production from wastewater using simple process control. *Alejandro Vargas, Universidad Nacional Autonoma de Mexico, Mexico.*

Selecting locations for real-time control in urban stormwater systems. *Branko Kerkez, University of Michigan Ann Arbor, United States.*

Plant-wide control for enhancing nutrient removal, GHG emission and CH₄ production under varying influent loadings. *ChangKyoo Yoo, Kyung Hee University, Republic of Korea.*

Fault Detection and Early Warning

Assessment and interpretation of fouling progress in MBR plants using functional machine learning technique. *ChangKyoo Yoo, Kyung Hee University, Republic of Korea.*

Diagnosis and Decision Support

Deep learning-based fouling diagnosis of a pilot-scale MBR. *ChangKyoo Yoo, Kyung Hee University, Republic of Korea.*

Automation, Communication and Data Handling

Full integration of automation systems. *Javier Garcia Del Rio, Canal de Isabel II, Spain.*

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