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151	11-1 Control in nutrient removal: Part 3	(株)日立製作所 横井浩人
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159	Discussion & Closing Ceremony	富士電機システムズ(株) 細川浩一郎
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163	Poster Session	東亜ディーケーケー(株) 里田 誠

## Program at a Glance

Time	Sunday May 29	Monday May 30	Tuesday May 31	Wednesday June 1	Thursday June 2			
08:30-09:00		Registration				Technical Tour		
09:00-10:45		Session 1: Opening Ceremony & Plenary Session	Session 5-1	Session 5-2	Session 9-1		Session 9-2	
10:45-11:10		Coffee Break						
11:10-12:50		Session 2-1	Session 2-2	Session 6-1	Session 6-2		Session 10-1	Session 10-2
12:50-14:00		Lunch						
14:00-15:45	Registration & Get Together Party	Session 3-1	Session 3-2	Session 7-1	Session 7-2	Session 11-1	Session 11-2	
14:45-16:10		Coffee Break						
16:10-17:50		Session 4-1	Session 4-2	Session 8-1	Session 8-2	Session 12-1	Session 12-2	
17:50-18:40		ICA Specialist Group Meeting						
18:40-19:00								
19:00-20:00		Welcome Reception			Gala Dinner			
20:00-22:00								

- Poster Session will take place in Camellia Room from 9:00 to 18:00 throughout the conference.

Session 2-1: Fuzzy control & information system  
 Session 2-2: Respirometry for control & monitoring  
 Session 3-1: Sensors in anaerobic digestion  
 Session 3-2: Monitoring in water treatment  
 Session 4-1: Plant-wide control; Part1  
 Session 4-2: Expert system  
 Session 5-1: Control in anaerobic & anoxic processes  
 Session 5-2: Monitoring in water & wastewater treatment  
 Session 6-1: SBR control  
 Session 6-2: Detection & early warning; Part1  
 Session 7-1: Optimum management; Part1

Session 7-2: Detection & early warning; Part2  
 Session 8-1: Control in chlorination & aeration  
 Session 8-2: Software sensor  
 Session 9-1: Control in nutrient removal; Part1  
 Session 9-2: Monitoring & control of water distribution network  
 Session 10-1: Control in nutrient removal; Part2  
 Session 10-2: Surface water monitoring  
 Session 11-1: Control in nutrient removal; Part3  
 Session 11-2: Monitoring system  
 Session 12-1: Optimum management; Part2  
 Session 12-2: Plant-wide control; Part2

# Scientific Program Schedule

Monday, May 30

Session 1. Plenary Session

Grand Ballroom

**Chairperson: Tae-Joo Park**

- 09:00-09:05 Welcoming address  
*Inn Se Kim, President of Pusan National University (Korea)*
- 09:05-09:10 Welcoming address  
*Nam-sik Hur, Mayor of Busan Metropolitan City (Korea)*
- 09:10-09:20 ICA and water in Korea - Overview  
*Changwon Kim, Tae-Joo Park, Sanghyun Kim, Haejin Woo, Inseong Hwang, Jeong-Eun Oh (Korea)*
- 09:20-10:00 Japan's water and sewage service systems at a turning point and the challenge of ICA technology  
*Sabro Matsui, Takao Kato, Yoshihisa Shimizu (Japan)*
- 10:00-10:40 Instrumentation, control and automation in the water industry - State-of-the-art and new challenges  
*Gustaf Olsson (Sweden)*

Session 2-1: Fuzzy control & information system

Ballroom A

**Chairperson: Marinus K. Nielsen, Burkhard Teichgräber**

- 11:10-11:35 Feasibility of controlling nitrification in predenitrification plants using DO, pH and ORP sensors  
*Yong Ma, Yongzhen Peng, Zhiguo Yuan, Shuying Wang, Xuele Wu (China, Australia)*
- 11:35-12:00 Fuzzy control of dissolved oxygen and on-line OUR estimation in a SBR pilot plant  
*M. Rubio, M. Ruiz, M. F. Terán, F. Arroyo, J. Colomer, J. Colprim (Spain)*
- 12:00-12:25 Cell-phone based assistance for waterworks/sewage plant maintenance  
*Takushi Kawada, Koji Nakamichi, Nobuyuki Hisano, Misayo Kitamura, Koji Miyahara (Japan)*
- 12:25-12:50 Information visualisation on mobile devices - An efficient information management for wastewater facilities  
*Heidrun Steinmetz, Jürgen Wiese, Jochen Ehret, Achim Ebert (Germany)*

Session 2-2: Respirometry for control & monitoring

Ballroom C

**Chairperson: Abraham Klapwijk, Myung-Won Choi**

- 11:10-11:35 Improving the start-up of an EBPR system using OUR to control the aerobic phase length: A simulation study  
*Albert Guisasola, Maite Pijuan, Juan Antonio Baeza, Julián Carrera, Javier Lafuente (Spain)*
- 11:35-12:00 Monitoring biodegradation of diesel fuel in bioventing processes using in-situ respiration rate  
*Tae-Ho Lee, Im-Gyu Byun, Young-O Kim, Inseong Hwang, Tae-Joo Park (Korea)*
- 12:00-12:25 Automatic detection of exogenous respiration end-point using artificial neural network  
*Iemke Bisschops, Henri Spanjers, Karel Keesman (The Netherlands)*
- 12:25-12:50 Improving oxygen concentration control in activated sludge process with estimation of respiration and scheduling control  
*Samo Gerkšič, Darko Vrečko, Nadja Hvala (Slovenia)*

### Session 3-1: Sensors in anaerobic digestion

Ballroom A

**Chairperson: David Cecil, Tae-Ho Lee**

- 14:00-14:30 Instrumentation in anaerobic treatment – Research and practice  
*Henri Spanjers, Jules B. van Lier (The Netherlands)*
- 14:30-14:55 On-line estimation of kinetic parameters in anaerobic digestion using observer-based estimators and multiwavelength fluorometry  
*E. Morel, B. Tartakovsky, S.R. Guiot, M. Perrier (Canada)*
- 14:55-15:20 Industrial scale validation of a new titrimetric sensor for anaerobic digestion processes: Comparison of methodologies  
*G. Ruiz, F. Molina, J.-P. Steyer, Peter A. Vanrolleghem, U.Zaher, E. Roca, J.M. Lema (Spain, Colombia, France, Belgium)*
- 15:20-14:45 A prototype system for monitoring of hydrogen sulfide production related processes in sewer networks  
*Ernis Saracevic, Stefan Winkler, Lydia Brooks, Fatima Bertran de Lis, Norbert Matsché (Austria)*

### Session 3-2: Monitoring in water treatment

Ballroom C

**Chairperson: Yoshihisa Shimizu, Jun Ha Kim**

- 14:00-14:30 Field properties and accuracy of in-situ water quality sensors  
*Stefan Winkler (Austria)*
- 14:30-14:55 Efficient design and operation of data acquisition system for pressurized pipeline systems  
*Sanghyun Kim (Korea).*
- 14:55-15:20 A disposable microsensor for continuous monitoring of free chlorine in water  
*Anjum Mehta, Halakatti Shekhar, Seung H. Hyun, Seungkwan Hong, Hyoung J. Cho (USA, Korea)*
- 15:20-15:45 Monitoring of coagulation performance and determination of coagulant dosage using a pilot in-line filter  
*Sang-Goo Kim, Jae-Soon Noh, Keun-Joo Choi, Hee-Jong Son, Ki-Woon Kwon, Pan-Se Shin, Yong-Doo Lee, Seung-Hyun Kim (Korea)*

### Session 4-1: Plant-wide control; Part1

Ballroom A

**Chairperson: Gustaf Olsson, Rudy Palsenbarg**

- 16:10-16:35 Survey for the open control system for data networks and system automation in water treatment systems  
*Seong-Pyo Cheon, Hyeon Bae, Sungshin Kim, Ji Soo Park (Korea)*
- 16:35-17:00 Application of an automation system and a supervisory control and data acquisition (SCADA) system for the optimal operation of a membrane adsorption hybrid system  
*Paul James Smith, Saravanamuth Vigneswaran, Huu Hao Ngo, Hung T. Nguyen, Roger Ben-Aim (Australia, France)*
- 17:00-17:25 Forecasting influent flowrate and composition with occasional data for supervisory management system by time series model  
*Jong-Rack Kim, Joo-Hyung Ko, Jeong-Hoon Im, Tae-Joo Park, Changwon Kim, Haejin Woo (Korea)*
- 17:25-17:50 Supervisory control strategies for the new WWTP of Galindo - Bilbao: The long run from the conceptual design to the full-scale experimental validation  
*E. Ayesa, A. De la Sota, P. Grau, J.M. Sagarna, A. Salterain, J. Suescun J. (Spain)*

### Session 4-2: Expert system

Ballroom C

**Chairperson:** *Peter A. Vanrolleghem, Miroslav Zelezny*

- 16:10-16:35 Development and commissioning of decision support tools for sewerage management  
*Gildas Manic, Cyril Printemps, Mathieu Zug, Gyrille Lemoine (France)*
- 16:35-17:00 Demonstration of a tool for automatic learning and reuse of knowledge in the activated sludge process  
*Joaquim Comas, Ignasi Rodríguez-Roda, Manel Poch, Krist V. Gernaey, Christian Rosen, Ulf Jeppsson (Spain, Sweden)*
- 17:00-17:25 Knowledge-based fuzzy system to diagnosis and control of an integrated biological wastewater treatment process  
*Olga C. Pires, Cíntia Palma, José Carlos Costa, Isabel Moita, M. Madalena Alves, Eugénio C. Ferreira (Portugal)*
- 17:25-17:50 Decision algorithm based on data mining for coagulant type and dosage in water treatment system  
*Hyeon Bae, Sungshin Kim, Yejin Kim (Korea)*

## Tuesday, May 31

### Session 5-1: Control in anaerobic anoxic processes

Ballroom A

**Chairperson:** *Insoo Kim, Ian Trillo*

- 09:00-09:30 Lessons learnt from 15 years of ICA in anaerobic digestion processes  
*J.P. Steyer, O. Bernard, D. Batstone (France, Denmark)*
- 09:30-09:55 Extremum-seeking with variable gain control for intensifying biogas production in anaerobic fermentation  
*Jing Liu, Gustaf Olsson, Bo Mattiasson (Sweden)*
- 09:55-10:20 Controlling the ammonium:nitrite ratio in a SHARON reactor in view of its coupling with an Anammox process  
*Eveline I. P. Volcke, Mark C. M. van Loosdrecht, Peter A. Vanrolleghem (Belgium, The Netherlands)*
- 10:20-10:45 Implementation of in-line infrared monitor in full-scale anaerobic digestion process  
*Henri Spanjers, Jean-Claude Bouvier, Paul Steenweg, Iemke Bisschops, Wim van Gils, Bram Versprille (The Netherlands, France)*

### Session 5-2: Monitoring in water & wastewater treatment

Ballroom C

**Chairperson:** *Saravarnnuth Vigneswaran, Kwang-Soo Choi*

- 09:00-09:30 New measurement techniques for secondary settlers: A review  
*Peter A. Vanrolleghem, Bob De Clercq, Jeriffa De Clercq, Martijn Devisscher, David J. Kinnear, Ingmar Nopens (Belgium)*
- 09:30-09:55 Wastewater fingerprinting by UV-visible and synchronous fluorescence spectroscopy  
*J. Wu, M-N Pons, O. Potier (China, France)*
- 09:55-10:20 Advanced settling velocity function and estimation of sludge settling parameters from batch settling experiment  
*Chang-Won Suh, Hyeong-Seok Jeong, Sang-Hyung Lee, Hang-Sik Shin (Korea)*
- 10:20-10:45 Application of on-line respiratory measurement for wastewater treatment plants control  
*Korneliusz Miksch, Joanna Surmacz-Górska, Piotr Ostrowski (Poland)*

## Session 6-1: SBR control

Ballroom A

### **Chairperson: Marie-Noelle Pons, Hyunook Kim**

- 11:10-11:35 A process-dependent real-time controller for sequencing batch reactor plants – Results of full-scale operation  
*Juergen Wiese, Jochen Simon, Heidrun Steinmetz (Germany)*
- 11:35-12:00 Full-cyclic control strategy of SBR for nitrogen removal in strong wastewater using common sensors  
*Kyung-Min Poo, Jeong-Hoon Im, Byung-Hee Jun, Kwang-Soo Choi, Changwon Kim, Haejin Woo (Korea)*
- 12:00-12:25 Model-based evaluation of an on-line control strategy for SBRs based on OUR and ORP measurements  
*Lluís Corominas, Gürkan Sin, Sebastià Puig, Adama Traore, Maria Dolors Balaguer, Jesús Colprim, Peter A. Vanrolleghem (Belgium, Spain)*
- 12:25-12:50 An on-line optimization of a SBR cycle for carbon and nitrogen removal based on on-line pH and OUR: The role of dissolved oxygen control  
*Sebastià Puig, Lluís Corominas, Adama Traore, Joan Colomer, Maria Dolors Balaguer, Jesús Colprim (Spain)*

## Session 6-2: Detection & early warning; Part1

Ballroom C

### **Chairperson: Henri Spanjers, Ching-Shyung Hwu**

- 11:10-11:35 Application of a multi-channel system for continuous monitoring and early warning system  
*Jin Hyung Lee, Byoung Chan Kim, Man Bock Gu (Korea)*
- 11:35-12:00 Quantification of immobilized microbial membrane activity and the improvement of sensitivity for toxicants in biosensors using nitrifying bacteria  
*T. Inui, Y. Tanaka, Y. Okayasu, H. Tanaka (Japan)*
- 12:00-12:25 Temperature-based rapid toxicity test using *Ceriodaphnia dubia*  
*Byong-Hee Jun, Sang-Il Lee, Hong-Duck Ryu, Y. J. Kim (Korea)*
- 12:25-12:50 Biosensor-based control of nitrification inhibitor in municipal wastewater treatment plants  
*Yuji Okayasu, Hiroaki Tanaka, Takashi Inui, Yoshiharu Tanaka (Japan)*

## Session 7-1: Optimum management; Part1

Ballroom A

### **Chairperson: Bob Hill, Eduardo Ayesa**

- 14:00-14:30 Current trends in integrated operation systems based on facility automation  
*Doo-Gyoon Byun (Korea)*
- 14:30-14:55 Total cost minimization control scheme for biological wastewater treatment process and its evaluation based on COST benchmark proces  
*Osamu Yamanaka, Takumi Obara, Katsuya Yamamoto (Japan)*
- 14:55-15:20 Estimating costs and benefits of advanced control for wastewater treatment plants - the Magic methodology  
*M. Devisscher, G. Ciacci, L. Fé, L. Benedetti, D. Bixio, C. Thoeye, G. De Gueldre, S. Marsili-Libelli, P. A. Vanrolleghem (Belgium, Italy)*
- 15:20-15:45 Simulation of energy consumption in wastewater treatment  
*Jens Alex, Michael Ogurek, Ulrich Jumar (Germany)*

## Session 7-2: Detection & early warning; Part2

Ballroom C

### **Chairperson: Sabro Matsui, Inseong Hwang**

- 14:00-14:30 Uncertainty reduction in integrated control: Confronting model predictions with information from on-line data  
*Marinus Kristian Nielsen, Mette Lindstrøm, Krist Gernaey, Henrik Madsen (Denmark, Sweden)*

- 14:30-14:55 Monitoring of pH inhibition on microbial activity in a continuous flow reactor by pseudo toxic concentration ( $C_{PT}$ ) concept and time delay model  
*Joo-Hyung Ko, Jong-Rack Kim, Inseong Hwang, Jeong-Eun Oh, Changwon Kim, Haejin Woo (Korea)*
- 14:55-15:20 Fault detection for control of wastewater treatment plants  
*Oliver Schraa, Bruce Tole, John B. Copp (Canada)*
- 15:20-15:45 Equipment fault diagnosis system of sequencing batch reactor (SBR) using rule-base fuzzy inference and on-line sensing data  
*Yejin Kim, Hyeon Bae, Kyung-Min Poo, Joo-Hyung Ko, Changwon Kim, Haejin Woo (Korea)*

## Session 8-1: Control in chlorination & aeration

Ballroom A

**Chairperson: Masashi Goto, Jeong-Eun Oh**

- 16:10-16:35 Improvement of ammonia removal in activated sludge process with feedforward-feedback aeration controllers  
*Darko Vrečko, Nadja Hvala, Aljaž Stare, Olga Burica, Marjeta Stražar, Meta Levstek, Peter Cerar, Sebastjan Podbevšek (Slovenia)*
- 16:35-17:00 Feedforward aeration control using on-line offgas analysis  
*Ian Trillo, Thomas E. Jenkins, Dave Redmon, Timothy Hilgart, Juan Trillo (Spain, US)*
- 17:00-17:25 Modelling of aeration systems at wastewater treatment plants  
*Leiv Rieger, Jens Alex, Willi Gujer, Hansruedi Siegrist (Switzerland, Germany)*
- 17:25-17:50 New process control strategy for wastewater chlorination and dechlorination using ORP/pH  
*Hyunook Kim, Soyong Kwon, Seungho Han, Myongjin. Yu, Sungho Gong, Mark F. Colosimo (Korea, USA)*

## Session 8-2: Software sensor

Ballroom C

**Chairperson: Zhiguo Yuan, Henrik A. Thomsen**

- 16:10-16:35 On-line concentration measurements in wastewater using nonlinear deconvolution and partial least squares of spectrophotometric data  
*Alejandro Vargas, Germán Buitrón (Mexico)*
- 16:35-17:00 A model of the redox measurement in aerated activated sludge  
*David Cecil, Eivind Skou (Denmark)*
- 17:00-17:25 On-line estimation and detection of abnormal substrate concentrations in WWTPs using a software sensor: a benchmark study  
*Farid Benazzi, Krist V. Gernaey, Ulf Jeppsson, Reza Katebi (UK, Sweden)*
- 17:25-17:50 Integrated soft sensor model for flow control  
*Glen Äijälä, Doug Lumley (Sweden)*

## Wednesday, June 1

### Session 9-1: Control in nutrient removal; Part1

Ballroom A

**Chairperson: In-Beum Lee, Juan Antonio Baeza**

- 09:00-09:30 Sludge population optimisation in biological wastewater treatment systems through on-line process control: What can we achieve?  
*Zhiguo Yuan, Yongzhen Peng, Adrian Oehmen, Huabing Lu, Christian Fux, Jurg Keller (Australia, China)*
- 09:30-09:55 Influence of closed loop control on microbial diversity in a nitrification process  
*Daisy Bougard, Nicolas Bernet, Patrick Dabert, Jean-Philippe Delgenes,*

- Jean-Philippe Steyer (France)*
- 09:55-10:20 Estimation method of primary sludge dosing for the improvement of nutrient removal and reduction of waste sludge in the advanced activated sludge process  
*Takeshi Takemoto, Misaki Sumikura, Shouji Watanabe, Bunchi Kimura, Naoki Hara (Japan)*
- 10:20-10:45 Design of a control strategy for optimal start-up of a high-strength nitrification system  
*Irene Jubany, Juan Antonio Baeza, Julián Carrera, Javier Lafuente (Spain)*

Session 9-2: Monitoring & control of water distribution network. Ballroom C

**Chairperson: Sanghyun Kim, Osamu Yamanaka**

- 09:00-09:30 Optimal control of water distribution  
*Bob Hill, Steve Conrad, Harold Kidder, Rick Riddle (USA)*
- 09:30-09:55 Study on the introduction of HACCP (Hazard Analysis and Critical Control Point) concept of the water quality management in water supply systems  
*Hiroto Yokoi, Ichiro Embutsu, Mikio Yoda, Kunio Waseda (Japan)*
- 09:55-10:20 Failure monitoring in water distribution networks  
*Dalius Misiunas, John Vitkovský, Gustaf Olsson, Martin Lambert, Angus Simpson (Sweden, Australia)*
- 10:20-10:45 Automatic anti-corrosion control in water distribution system based on calcium carbonate precipitation potential (CCPP)  
*Do-Hwan Kim, Jae-In Lee, Ji-Hyung Lee, Soon-Heon Hong, Dong-Youn Kim, Haejin Woo (Korea)*

Session 10-1: Control in nutrient removal; Part2 Ballroom A

**Chairperson: Doug Lumley, Joo-Hyung Ko**

- 11:10-11:35 Optimization of an oxidation ditch operating system  
*Eun-Hee Choi, Bram Klapwijk, Mathijs Oosterhuis (Korea, The Netherlands)*
- 11:35-12:00 Simulation of integrated control strategies for improving nitrogen removal and reducing external carbon dosage  
*Xiaolian Wang; Yongzhen Peng, Yong Ma, Shuying Wang (China)*
- 12:00-12:25 Application of a model-based optimisation methodology for nutrient removing SBRs leads to falsification of the model  
*Gürkan Sin, Kris Villez, Peter A. Vanrolleghem (Belgium)*
- 12:25-12:50 Development of real-time aeration control system based on ORP and DO for enhanced nitrogen removal  
*Yun Jung Kim, Jae Geol Lee, Jong Hoon Lee, Chae Young Lee, Young Gyun Choi, Tai Hak Chung (Korea)*

Session 10-2: Surface water monitoring Ballroom C

**Chairperson: Man Bock Gu, Gary Wong**

- 11:10-11:35 Solar and tidal modulations of indicator bacteria in coastal waters at Huntington Beach, California  
*Joon Ha Kim, Jung-Woo Kim, Jihee Moon, Sung-Keun You, Anna Liw, Jongho Won, Abul Bashar Mohammad Giasuddin, Seojin Ki, Heechul Choi, Semsu Ensari (Korea, USA)*
- 11:35-12:00 Applicability of inexpensive and rapid analytical methods for dioxins in river sediments  
*K. Komori, H. Tanaka, M. Yasojima, M. Minamiyama, Y. Suzuki, Y. Miyake, M. Kato, K. Urano (Japan)*
- 12:00-12:25 Spectral data for monitoring and control of a surface water treatment plant



- G. Langergraber, N. Fleischmann, A. Pressl, G. Tassinato, E. Piazzola, W. Lettl (Austria, Italy)*
- 12:25-12:50      New intake control system based on river water quality  
*Seiji Furukawa, Akira Morikawa, Naoto Masuda, Isao Sakaguchi (Japan)*

Session 11-1: Control in nutrient removal; Part3

Ballroom A

**Chairperson: Jean-Philippe Steyer, Eun-Hee Choi**

- 14:00-14:25      Modelling and control strategy testing of biological and chemical phosphorus removal at Avedøre WWTP  
*P. Ingildsen, C. Rosen, K.V. Gernaey, M.K. Nielsen, T. Guildal, B.N. Jacobsen (Denmark, Sweden).*
- 14:25-14:50      Identification of adverse effect of nitrate on phosphate release rate and improvement of EBPR process model  
*Sung-Hak Lee, Joo-Hyung Ko, Yejin Kim, Tae-Ho Lee, Changwon Kim, Haejin Woo (Korea)*
- 14:50-15:15      Introducing biological phosphorus removal in an alternating plant by means of control – a full scale study  
*C. Rosen, P. Ingildsen, T. Guildal, T. Munk Nielsen, M.K. Nielsen, B. N. Jacobsen, H.A. Thomsen (Sweden, Denmark)*
- 15:15-15:45      Comparison of nitrogen removal from sewage with low C/N ratio by ORP control modes in a hybrid biofilm pilot plant  
*Young-O Kim, Tae-Ho Lee, Hai-Uk Nam, Doo-Ho Kim, Tae-Joo Park (Korea)*

Session 11-2: Monitoring system

Ballroom C

**Chairperson: Shinji Ide, Korneliusz Miksch**

- 14:00-14:25      Sensor validation and reconciliation for a partial nitrification process  
*Changkyoo Yoo, Kris Villez, In-Beum Lee, Stijn Van Hulle, Peter A. Vanrolleghem (Korea, Belgium)*
- 14:25-14:50      Development of a coliforms monitoring system using an enzymatic fluorescence method  
*Akira Morikawa, Isamu Hirashiki, Seiji Furukawa (Japan)*
- 14:50-15:15      Titrimetric monitoring of a completely autotrophic nitrogen removal process  
*Stijn Van Hulle, Usama Zaher, Griet Schelstraete, Peter A. Vanrolleghem (Belgium)*
- 15:15-15:40      SBRs on-line monitoring by set-point titration  
*Nicola Fiocchi, Elena Ficara, Roberto Canziani, Luca Luccarini, Francesco Ciappelloni, Paolo Ratini, Massimiliano Pirani, Simone Mariani (Italy)*

Session 12-1: Optimum management; Part2

Ballroom A

**Chairperson: John Copp, Jeong-Hoon Im**

- 16:10-16:35      Optimal flow distribution over multiple parallel pellet reactors: A model-based approach  
*K.M. van Schagen, R. Babuška, L.C. Rietveld, E.T. Baars (The Netherlands)*
- 16:35-17:00      WWTP dynamic disturbance modelling – an essential module for long-term benchmarking development  
*Krist V. Gernaey, Christian Rosen, Ulf Jeppsson (Sweden)*

**Chairperson: Ulf Jeppsson, Changkyoo Yoo**

- 16:10-16:35 Automated and integrated process control and operation of the Greater Vancouver five wastewater treatment plants  
*Miroslav Zelezny, Rudy Palsenbarg (Canada)*
- 16:35-17:00 Side by side comparison demonstrated a 36% increase of nitrogen removal and 19% reduction of aeration requirements using a feed forward online optimization system  
*Wenjun Liu, George J. F. Lee (USA)*

## Discussion

## Grand Ballroom

- 17:00-17:50 Discussion and Closing  
*Changwon Kim (Korea)*

## Poster Session

## Camellia Room

## 09:00 ~ 17:50 Monday, May 30

## Session 1: Anaerobic digestion

- P1-01 An automated multi-channel system for real time monitoring of anaerobic biodegradability and activity  
*Ching-Shyung Hwu, Y. S. Wu, Cheng-Hsien Huang (Taiwan)*
- P1-02 Thermal, ultrasonic and alkaline co-pretreatment for an enhanced acidogenic fermentation process with waste sludge  
*Dong-Yueb Han, Tae-Kyu Eom (Korea)*

## Session 2: Advanced Control and Management

- P2-01 Practical technology for business integration  
*Miroslav Zelezny, Gary Wong (Canada)*
- P2-02 A learning process with benchmarking and system simulation for wastewater treatment plant to improve operation  
*J. H. Chang, T. W. Chi (Taiwan)*
- P2-03 Fuzzy control for optimization of step-feed biological nitrogen removal process  
*Peng Yongzhen, Zhu Guibing, Wang Shuying, Wu Shuyun (China)*
- P2-04 Unmanned inspection of large sewers under operating conditions  
*Burkhard Teichgräber, Jochen Stemplewski, Heiko Althoff, Norbert Elkmann (Germany)*
- P2-05 Influent load prediction using low order adaptive modelling  
*Johan Lindqvist; Torsten Wik; Doug Lumley; Glen Äijälä (Sweden)*
- P2-06 PLS-based supervisory control of the single reactor high activity ammonia removal over nitrite (SHARON) process  
*Kris Villez, Christian Rosén, Eveline Volcke, ChangKyoo Yoo, Peter A. Vanrolleghem (Belgium, Sweden)*
- P2-07 Decision support for wastewater agencies  
*Z. Cello Vitasovic (Denmark)*
- P2-08 Extension of the IWA/COST simulation benchmark to include expert reasoning for system performance evaluation  
*Joaquim Comas, Ignasi Rodríguez-Roda, Manel Poch, Krist V. Gernaey, Christian Rosen, Ulf Jeppsson (Spain, Sweden)*

- P2-09 Web-based information system for controlling membrane bioreactor  
*Jinwoo Cho, Kyu-Hong Ahn, Kyung-Guen Song, Sung Kyu Maeng (Korea)*
- P2-10 A study on the analysis of real time data using SCADA system in water distribution system  
*Hyun-Dong Lee, Choong-Nam Joo, Phill-Jae Kwak, Jae-Woon Hwang (Korea)*
- P2-11 Nonlinear kernel partial least squares modelling of a full-scale industrial anaerobic filter process  
*Dae Sung Lee, Min Woo Lee, Seung Han Woo, Jong Moon Park (Korea)*

### Session 3: Detection and early warning

- P3-01 Automatic fault diagnosis of equipment by vibration signal analysis using time-series data mining  
*Sungshin Kim, Hyeon Bae, Dae-Won Choi, Yejin Kim (Korea)*
- P3-02 Application of pH inhibition models to various microorganism group and suggestion of model selection criterion  
*Joo-Hyung Ko, Kyung-Min Poo, Jung-Joon Lee, Sungshin Kim, Changwon Kim, Haejin Woo (Korea)*

### Session 4: Sensors and Monitoring

- P4-01 Relationship between the concentration of non-biodegradable dissolved organic matters in Lake Biwa North Basin and storage capacity of its catchment area - A change in contact time between soil and water -  
*S. Ide, F. Kobayashi (Japan)*
- P4-02 Development of real time monitor of chlorine demand for combined sewer overflow  
*M. Satoda, T. Urushibara, T. Imai (Japan)*
- P4-03 Results of field tests and possible applications for in-situ sludge volume probes  
*Jochen Simon, Jürgen Wiese, Heidrun Steinmetz (Germany)*
- P4-04 An advanced ionic conductivity method monitoring the influx of unpurified water into a pure water cycle  
*Jeom-In Baek, T. W. Lee (Korea)*
- P4-05 Development of a microbial BOD sensor  
*Mia Kim, Byoung Sun Park, Won Hui Cho, Moon Sik Hyun, Taekyung Yoon, Nak Chang Sung, Dong-Hyo Kang, Dong Hee Yi, Hyung Joo Kim (Korea)*
- P4-06 Novel toxicity monitoring system using microbial fuel cells  
*Gil-Ju Jin, Jun Hee Kwak, Mia Kim, Moon Sik Hyun, Taekyung Yoon, Nak Chang Sung, Dong-Hyo Kang, Dong Hee Yi, Hyung Joo Kim (Korea)*
- P4-07 Development of real time monitoring system for wastewater water qualities by optical sensing technique  
*Kyungju Kim, Seockheon Lee, Kyu-Hong Ahn (Korea)*
- P4-08 Total microbial density ( $d_{tm}$ ) as a new parameter for the definition of aerobic granule by CLSM equipped with AxiocamHRm  
*In S. Kim, Sung-Min Kim, Hye-Jung Jung (Korea)*
- P4-09 Storm water effect on water quality and comparison of phases of pollutants between branches in urban and rural streams of Han-river during/after precipitation  
*Jin-sung Ra, Ji-ho Lee, Jun-ho Jeon, Cuong Doung, Akhtar A. Shah, Hyeonmi Chung, Sang Don Kim, Joon Ha Kim (Korea)*
- P4-10 Statistical Investigation of the feature of the algal bloom in paldang lake  
*Byung Tae Lee, Eun Young Choe, Yong Sung Cho, Jong Won Le, Ji Hyun Kwak, V.A. Nguene, Hyeonmi Chung, Joon Ha Kim (Korea)*
- P4-11 Non-linear water quality parameter optimization: Automated system development and its application  
*C. H. Je, K. S. Kim (USA, Korea)*
- P4-12 Bioluminescent cell array biosensors for water toxicity analysis  
*Jin Hyung Lee, Chul Hee Yun, Javed H. Niazi, Robert J. Mitchell, Byoung*

- Chan Kim, Man Bock Gu (Korea)*
- P4-13 Monitoring of bioventing process for diesel-contaminated soil by dehydrogenase activity, microbial counts and the ratio of n-alkane/isoprenoid  
*Im-Gyu Byun, Young-O Kim, Inseong Hwang, H. S. Kim, Tae-Joo Park, Tae-Ho Lee (Korea)*
- P4-14 New approach the substrate utilization and respiration by the step growth concept in activated sludge model  
*Youn-Kwon Kim, In-Seok Seo, Hong-Suck Kim, Ji-Yeon Kim (Korea)*
- P4-15 Detection of specific sludge bacteria observed in the activated sludge using DNA microarray and T-RFLP  
*Ji Hyun Park, Byoung Chan Kim, Man Bock Gu (Korea)*
- P4-16 COD determination using ultrasound digestion and ORP based titration  
*Hyunook Kim, Honglae Lim, Seungku Ahn, Mark F. Colosimo (Korea, USA)*
- P4-17 Spatio-temporal analysis of water quality in the han river, Korea: mass flux approach  
*Jung-Woo Kim, Jihee Moon, Baek-Su Ki, Sung-Keun You, Anna Liw, Jongho Won, Hyeonmi Chung, Heechul Choi, Joon Ha Kim (Korea)*
- P4-18 Steady State Models for Non-Conservative Pollutant Mixing in the Surf Zone  
*Joon Ha Kim, Baek-Su Ki, Seung-Whan Lee, Young-Geun Lee (Korea)*
- P4-19 A physical-biological marine ecosystem model for assessing nutrients input reaction in Jinhae Bay, South Korea  
*Hyun Taik OH, Won Chan LEE (Korea)*

## Session 5: Process Control

- P5-01 A simulation approach for evaluating solid-liquid separation system viewed from both quantity and quality of separated liquid in sludge  
*Akira Hiratsuka, Isao Awata, Munetaka Ishikawa (Japan)*
- P5-02 Assessing six external carbon dosage control strategies for improving denitrification using a simulation benchmark model  
*Zhiguo Yuan (Australia)*
- P5-03 Simultaneous nitrification-denitrification and control in a sequencing batch biofilm reactor  
*J. Li, G. W. Gu, S. Wu, Y. Z. Peng, W. Q. Chi (China)*
- P5-04 Operation & control of hybrid reactor in treating cellulose wastewater  
*H. Ganjidoust, B. Ayati (Iran)*
- P5-05 A Study on control chlorine dose in water treatment plants  
*Sueg-Young Oh, Doo-Gyoon Byun, Jae-Moon Hwang, Hyun-Sung Song (Korea)*
- P5-06 A Study on effective sludge discharge for sedimentation basin  
*Sueg-Young Oh, Doo-Gyoon Byun, Jae-Moon Hwang, Ji-Soo Park (Korea)*
- P5-07 Modeling of a two-reactor SBR system for nitrogen and phosphorus removal using a simplified ASM2d  
*Bong Soo Lim, W. Z. Huang, Hyunook Kim (Korea)*
- P5-08 Modeling a bench-scale alternating aerobic/anoxic activated sludge system for nitrogen removal using ASM1  
*Hyunook Kim, Honglae Lim, Soohong Noh, Honglim Choi (Korea)*
- P5-09 Practice of ASM3 and EAWAG Bio-P module for simulating five-stage step-feed EBPR process comparing with ASM2d  
*Sung-Hak Lee, Joo-Hyung Ko, Jong-Bok Pak, Jeong-Hoon Im, Changwon Kim, Haejin Woo (Korea)*