2nd DCPM Workshop
at the IFAC World Congress 2023

Digital Twins to Improve Medical Care track
organized by the DCPM partners (three sessions)

Monday July 10, 2023 16:00-18:00
Room 418 Open Invited Session MoC18

Digital Twins to Improve Medical Care I

MoC18	Room 418
Digital Twins to Improve Medical Care I	Open Invited Session
Chair: Desaive, Thomas	University of Liege
Co-Chair: Chase, J. Geoffrey	University of Canterbury
Organizer: Desaive, Thomas	University of Liege
Organizer: Chase, J. Geoffrey	University of Canterbury
Organizer: Chiew, Yeong Shiong	Monash University
Organizer: Suhaimi, Fatanah	Universiti Sains Malaysia
Organizer: Knopp, Jennifer L.	University of Canterbury
Organizer: Kovacs, Levente	Obuda University
Organizer: Zhou, Cong	University of Canterbury
Organizer: Ionescu, Clara	Ghent University

16:00-16:20, Paper MoC18.1

 Patient-Ventilator Interaction Using Autoencoder Derived Magnitude of Asynchrony Breathing (I)

Loo, Nien Loong	Monash University
Chiew, Yeong Shiong	Monash University
Ang, Christopher Yew Shuen	Monash University Malaysia
Tan, Chee Pin	Monash University
Mat Nor, Basri	Department of Intensive Care, International Islamic University M

16:20-16:40, Paper MoC18.2

 Model-Based Identification of Work of Breathing in CPAP Ventilation of Adults (I)

Guy, Ella F. S.	University of Canterbury
Knopp, Jennifer L.	University of Canterbury
Lerios, Theodore	University of Canterbury, Christchurch
Chase, J. Geoffrey	University of Canterbury

16:40-17:00, Paper MoC18.3

[Physical Simulation of Obstructive Respiratory Disease (I)](#)

[Clifton, Jaimey A.](#)	University of Canterbury
[Wilkins, Elliott L.](#)	University of Canterbury
[Edmonds, Alexandra](#)	University of Canterbury
[Smith, Chris](#)	University of Canterbury
[Guy, Ella F. S.](#)	University of Canterbury
[Lerios, Theodore](#)	University of Canterbury, Christchurch
[Knopp, Jennifer L.](#)	University of Canterbury
[Chase, J. Geoffrey](#)	University of Canterbury

17:00-17:20, Paper MoC18.4

[Pulmonary Response Prediction Comparison through Three Personalized Basis Functions in a Virtual Patient Model (I)](#)

[Caljé-van der Klei, Trudy](#)	Mechanical Engineering, University of Canterbury
[Sun, Qianhui](#)	University of Canterbury
[Chase, J. Geoffrey](#)	University of Canterbury

17:20-17:40, Paper MoC18.5

[Comparison of Three Artificial Intelligence Methods for Predicting 90% Quantile Interval of Future Insulin Sensitivity of Intensive Care Patients (I)](#)

[Szabó, Bálint](#)	Budapest University of Technology and Economics
[Szlávecz, Ákos](#)	Budapest University of Technology and Economics
[Paláncz, Béla](#)	Budapest University of Technology and Economics
[Kovács, Katalin](#)	Széchenyi István University
[Chase, J. Geoffrey](#)	University of Canterbury
[Benyo, Balazs](#)	Budapest University of Technology and Economics

17:40-18:00, Paper MoC18.6

[Patient Spontaneous Effort Estimation in Digital Twin Model with B-Spline Function (I)](#)

[Sun, Qianhui](#)	University of Canterbury
[Chase, J. Geoffrey](#)	University of Canterbury
[Zhou, Cong](#)	University of Canterbury
[Tawhai, Merryn](#)	University of Auckland

Knopp, Jennifer L.   University of Canterbury
Moeller, Knut   Furtwangen University
Hu, Thomas   University of Canterbury

Shaw, Geoffrey M   Christchurch Hospital, Canterbury District Health Board

Tuesday July 11, 2023 10:00-12:00
Room 503 Open Invited Session TuA24

Digital Twins to Improve Medical Care II

TuA24   Room 503
Digital Twins to Improve Medical Care II Open Invited Session
Chair: Chiew, Yeong Shiong   Monash University
Co-Chair: Desaive, Thomas   University of Liege
Organizer: Desaive, Thomas   University of Liege
Organizer: Chase, J. Geoffrey   University of Canterbury
Organizer: Chiew, Yeong Shiong   Monash University
Organizer: Suhaimi, Fatanah   Universiti Sains Malaysia
Organizer: Knopp, Jennifer L.   University of Canterbury
Organizer: Kovacs, Levente   Obuda University
Organizer: Zhou, Cong   University of Canterbury
Organizer: Ionescu, Clara   Ghent University

10:00-10:20, Paper TuA24.1
 Fast Simulation of Pharmacokinetics

Wahlquist, Ylva   Lund University
Bagge Carlson, Fredrik   Lund University, Dept. Automatic Control
Soltesz, Kristian   Lund University

10:20-10:40, Paper TuA24.2
 Abdominal Multi-Organ Segmentation Based on Feature Pyramid Network and Spatial Recurrent Neural Network

Song, Yuhan   Japan Advanced Institute of Science and Technology

Elibol, Armagan   Japan Advanced Institute of Science and Technology

Chong, Nak   Japan Advanced Institute of Science and Technology

10:40-11:00, Paper TuA24.3
 Tumor Modeling Method for the Stomach by Applying Phong's Reflection Model to Two Light

Sources on the Endoscope

Yamada, Yuta   Kagawa University
Kamewari, Ryusei   Kagawa University
Takahashi, Satoru   Kagawa University

11:00-11:20, Paper TuA24.4

On the Use of the Eleveld PK/PD Model for the Design of PID Control of Anesthesia (I)

Paolino, Nicola   University of Brescia
Schiavo, Michele   University of Brescia
Latronico, Nicola   University of Brescia
Paltenghi, Massimiliano   Spedali Civili Di Brescia
Visioli, Antonio   University of Brescia

11:20-11:40, Paper TuA24.5

Model-Based Glycemic Control Using Subcutaneous Insulin for Infants in Critical Care (I)

Zhou, Tony   University of Canterbury
Boettger, Merle   Carl Von Ossietzky University of Oldenburg
Knopp, Jennifer L.   University of Canterbury
Lange, Matthias   Carl Von Ossietzky University of Oldenburg
Heep, Axel   Carl Von Ossietzky University of Oldenburg
Chase, J. Geoffrey   University of Canterbury

Digital Twins to Improve Medical Care III

TuC24   Room 503
Digital Twins to Improve Medical Care III   Open Invited Session
Chair: Zhou, Cong   University of Canterbury
Co-Chair: Kovacs, Levente   Obuda University
Organizer: Desaive, Thomas   University of Liege
Organizer: Chase, J. Geoffrey   University of Canterbury
Organizer: Chiew, Yeong Shiong   Monash University
Organizer: Suhaimi, Fatanah   Universiti Sains Malaysia
Organizer: Knopp, Jennifer L.   University of Canterbury
Organizer: Kovacs, Levente   Obuda University
Organizer: Zhou, Cong   University of Canterbury
Organizer: Ionescu, Clara   Ghent University

16:00-16:20, Paper TuC24.1
Model-Based Identification of Flow-Limited and Non-Flow-Limited COPD Patients in Plethysmographic Data (I)

Lerios, Theodore   University of Canterbury, Christchurch
Knopp, Jennifer L.   University of Canterbury
Guy, Ella F. S.   University of Canterbury
Holder-Pearson, Lui   University of Canterbury
Chase, J. Geoffrey   University of Canterbury

16:40-17:00, Paper TuC24.3
Clinical Trial Validation of the STAR-3D Glycemic Control Framework (I)

Uyttendaele, Vincent   University of Liège
Knopp, Jennifer L.   University of Canterbury
Desaive, Thomas   University of Liege
Chase, J. Geoffrey   University of Canterbury

17:00-17:20, Paper TuC24.4
Model-Based Estimation of Neonatal Pleural Pressure (I)

McDonald, Mariah Aroha   University of Canterbury
Knopp, Jennifer L.   University of Canterbury
Guy, Ella F. S.   University of Canterbury

Dixon, Bronwyn

Chase, J. Geoffrey

Neonatal Intensive Care Unit, Christchurch Women's Hospital

University of Canterbury

17:20-17:40, Paper TuC24.5

 How Hard Is It to Breathe? Quantification of Lung Elastance and Inspiratory Work of Breathing in Healthy and COPD Patients (I)

Lerios, Theodore   University of Canterbury, Christchurch
Knopp, Jennifer L.   University of Canterbury
Holder-Pearson, Lui   University of Canterbury
Guy, Ella F. S.   University of Canterbury
Chase, J. Geoffrey   University of Canterbury

17:40-18:00, Paper TuC24.6

 Impact of STAR Glycaemic Control Framework on Nutrition Intake in a Belgian ICU (I)

Uyttendaele, Vincent   University of Liège
Knopp, Jennifer L.   University of Canterbury
Brixhe, Solenn   Haute Ecole De La Province De Liège
Pirotte, Marc   University Hospital of Liège
Lambermont, Bernard   University of Liege
Chase, J. Geoffrey   University of Canterbury
Desaive, Thomas   University of Liege