Optimisation in X-ray and Molecular Imaging 2020

Gothenburg, Sweden

22-24 June 2020

Programme

Preliminary as of 4 May 2020

OXMI 2020 Online meeting

Monday, 22 June 2020

09.00-10.30	*Oral session 1* **Conference opening and introductory session – Machine-learning-based segmentation and detection in medical imaging**

09.00-09.15	**Welcome and conference opening**
09.15-10.00	***Invited speaker*** **[O1-1] How can machine learning advance large population trials? – The Swedish CArdioPulmonary bioImage Study (SCAPIS)** Göran Bergström (University of Gothenburg and Sahlgrenska University Hospital) *Sweden*
10.00-10.15	**[O1-2] Pulmonary nodule detection in chest CT using a deep learning-based reconstruction algorithm** C Franck, M Spinhoven, A Snoeckx, H El Addouli, S Nicolay, A Van Hoyweghen, P Deak and F Zanca *Belgium and Germany*
10.15-10.30	**[O1-3] Development of deep learning-based segmentation for ^{177}Lu SPECT/CT based kidney dosimetry** J Khan, T Rydén, M Van Essen, J Svensson and P Bernhardt *Sweden*
10.30-10.40	**Presentation from exhibitors** Mediel

10.40-11.00	**Social and exhibitor interaction (see separate Zoom meeting)**

11.00-12.30	*Oral session 2* **Radiation dose and image quality in computed tomography**

11.00-11.15	**[O2-1] Clinical image quality evaluation studies in abdominal CT: effect of Advanced Modeled Iterative Reconstruction (ADMIRE) on potential dose reduction** B Kataria, J Nilsson Althén, Ö Smedby, A Persson, H Sökjer and M Sandborg *Sweden*
11.15-11.30	**[O2-2] Extra-colonic findings – identification at low-dose CTC** F Thorén, Å A Johnsson, J Brandberg, M Båth and M Hellström *Sweden*
11.30-11.45	**[O2-3] Effective dose and feasibility of scouts using real and alternative settings on different CT systems** T M Svahn and J C Ast *Sweden*
11.45-12.00	**[O2-4] Evaluating proposed dose and noise levels for chest CT** A Dedulle, H Bosmans, J Jacobs and N Fitousi *Belgium*
12.00-12.15	**[O2-5] Evaluation of the image quality in abdominal CT protocols based on Swiss diagnostic reference levels** D Racine, A Viry, C Aberle, T Lima, R Treier, S T Schindera and F R Verdun *Switzerland*
12.15-12.30	**[O2-6] Is the standard age classification correct for paediatric head CT examinations?** A Dedulle, K Houbrechts, J Jacobs, H Bosmans and N Fitousi *Belgium*
12.30-12.40	**Presentation from exhibitors** Philips

12.40-14.00	**Social and exhibitor interaction/Lunch (see separate Zoom meeting)**

14.00-15.40	*Oral session 3* **Mammography and tomosynthesis**
14.00-14.45	*Invited speaker* **[O3-1] Breast tomosynthesis in screening – from optimization to a large screening trial. 14 years of experience from Malmö, Sweden** Sophia Zackrisson (Lund University and Skåne University Hospital) *Sweden*
14.45-15.00	**[O3-2] The effect of dose reduction on the reproduction of anatomical structures in chest tomosynthesis** M Mirzai, C Meltzer, J Vikgren, R Rossi Norrlund, B Gottfridsson, Å Allansdotter Johnsson, M Båth and A Svalkvist *Sweden*
15.00-15.15	**[O3-3] Visual grading assessment and rejection rate evaluation for digital mammography** G Hellgren, M Dustler, S Zackrisson, A Bejnö and A Tingberg *Sweden*
15.15-15.30	**[O3-4] Assessment of image quality in digital mammography: from model observers to detective quantum efficiency evaluation** E Ramírez, S O Benavides, J Abella and W Lopera *Colombia*
15:30-15:40	**Presentation from exhibitors** Eizo Nordic

15.40-16.00	**Social and exhibitor interaction (see separate Zoom meeting)**

16.00-17.15	*Oral session 4* **Estimation of patient radiation doses in radiology**
16.00-16.15	**[O4-1] Retrospective analysis of whole body skeleton conventional radiography in myeloma staging** L Weber and M Geijer *Sweden*
16.15-16.30	**[O4-2] Comparison of organ doses in whole-body computed tomography scans of paediatric and adult patient models, estimated by different methods** L C Chipiga, A V Vodovatov, V Yu Golikov and C Bernhardsson *Russian Federation and Sweden*
16.30-16.45	**[O4-3] Measurement of radiation-induced microvascular changes in the skin after Chronic Total Occlusion Percutaneous Coronary Intervention (PCI-CTO)** E Tesselaar, P Vorel Macková, C Pagonis, S Saers, M Sandborg and M Ahle *Sweden*
16.45-17.00	**[O4-4] Estimation of the effective doses from typical fluoroscopic examinations with barium contrast** A V Vodovatov, V Yu Golikov, R R Akhmatdinov, I G Kamyshanskaya and C Bernhardsson *Russian Federation and Sweden*
17.00-17.15	**[O4-5] Effective dose in paediatric interventional cardiology** S Sarycheva *Russian Federation*

17.15-17.30	**Introduction to the poster session**

17.30-19.30	**Poster session 1** see separate list at the end of the programme

Tuesday, 23 June 2020

09.00-10.30	*Oral session 5* **Optimisation of molecular imaging, absorbed dose estimates and radiation risk models**
09.00-09.30	***Invited speaker*** **[O5-1] Personalised treatment planning for molecular radiotherapy.** **Part 1: The Good – benefits and opportunities** Glenn Flux (Royal Marsden Hospital and Institute of Cancer Research) *United Kingdom*
09.30-09.45	**[O5-2] Evaluation of the image quality in Monte Carlo based SPECT/CT reconstruction of ^{111}In-octreotide** E Wikberg, M van Essen, T Rydén and P Bernhardt *Sweden*
09.45-10.00	**[O5-3] IDAC-Alpha – an alpha dosimetry software for healthy tissue** M Andersson, T Meyer, E Koumarianou and S Mattsson *Sweden*
10.00-10.15	**[O5-4] Improved age and gender specific radiation risk models applied on cohorts of Swedish patients** M Andersson, K Eckerman, D Pawel, A Almén and S Mattsson *Sweden*
10.15-10.30	**[O5-5] X-ray and molecular imaging during pregnancy and breastfeeding – when should we be concerned?** S Mattsson and S Leide-Svegborn *Sweden*
10.30-10.40	**Presentation from exhibitors** Tesika Teknik

10.40-11.00	**Social and exhibitor interaction (see separate Zoom meeting)**

11.00-12.30	*Oral session 6* **Software and online tools enabling studies of image quality and radiation dose**
11.00-11.15	**[O6-1] Virtual clinical trials in medical imaging optimization** P R Bakic, B Barufaldi, M Dustler, A D A Maidment, S Zackrisson and A Tingberg *USA and Sweden*
11.15-11.30	**[O6-2] ViewDEX 3.0 – recent development of a software application facilitating assessment of image quality and observer performance** A Svalkvist, S Svensson, T Hagberg and M Båth *Sweden*
11.30-11.45	**[O6-3] A novel online framework for creating and performing reader studies in medical imaging** M Dustler, G Hellgren, P Bakic, P Kragsterman, J Norling, I Servan Rivero and S Zackrisson *Sweden and USA*
11.45-12.00	**[O6-4] Evaluation of VGC Analyzer by comparison with gold standard ROC software and analysis of simulated visual grading data** J Hansson, L G Månsson and M Båth *Sweden*
12.00-12.15	**[O6-5] An innovative personal online dosimetry system using computational calculations for personnel in interventional radiology** M Andersson, U O'Connor, M Abdelrahman, A Camp, V García, M Amor, M Ginjaume, F Vanhavere and A Almén *Sweden, Ireland, Belgium and Spain*
12.15-12.30	**[O6-6] Clinical optimization in fluoroscopic and interventional radiology by retrospective studies of DICOM Radiation Dose Structured Reports** C Granberg, M Hellström and J Andersson *Sweden*

12.30-12.40	**Presentation from exhibitors** Olórin

12.40-14.00	**Social and exhibitor interaction/Lunch (see separate Zoom meeting)**

14.00-15.30	*Oral session 7* **Addressing the potential for improved education, diagnostics and therapy**
14.00-14.30	*Invited speaker* **[O7-1] Personalised treatment planning for molecular radiotherapy.** **Part 2: The Bad – risks and threats** Glenn Flux (Royal Marsden Hospital and Institute of Cancer Research) *United Kingdom*
14.30-14.45	**[O7-2] Evaluation of the quality of education in courses on radiation protection in Germany** P Strauß, R Eßeling, G Stamm and H Lenzen *Germany*
14.45-15.00	**[O7-3] Evaluation of the quality of education in manufacturer's initial trainings for radiographic devices in Germany** P Strauß, R Eßeling, G Stamm and H Lenzen *Germany*
15.00-15.15	**[O7-4] Improving image quality by increasing the amount of light in the reading room** P Sund *Sweden*
15.15-15.25	**Presentation from exhibitors** Sectra Sverige

15.25-15.40	**Announcements**

15.40-16.00	**Social and exhibitor interaction (see separate Zoom meeting)**

16.00-17.15	*Oral session 8* **Quality control, quality assurance and characterisation of medical imaging systems**
16.00-16.15	**[O8-1] A Swedish implementation of manufacturer specific quality assurance for radiological equipment** H Sundström, J Sjöberg and J Andersson *Sweden*
16.15-16.30	**[O8-2] Automated QC for intervention system and mammography system** T Visanuyanont, P Gluchowski, T Moberg and E Hillberg *Sweden*
16.30-16.45	**[O8-3] Signal-to-noise ratio rate measurement in fluoroscopy for quality control and teaching good radiological imaging technique** H Elgström, E Tesselaar and M Sandborg *Sweden*
16.45-17.00	**[O8-4] Evaluation of spectral imaging with respect to iodine-concentration quantification and HU-values for monoenergetic reconstructions on six CT scanners from two vendors** N Sogge, I H R Hauge, H K Andersen, K N Bolstad, A Dybwad, S Jenu, H E S Pettersen, S Flatabø and A C T Martinsen *Norway*
17.00-17.15	**[O8-5] Frequency response and distortion properties of reconstruction algorithms in computed tomography** J Larsson, M Båth and A Thilander Klang *Sweden*

17.15-17.30	**Introduction to the poster session**

17.30-19.30	**Poster session 2** see separate list at the end of the programme

Wednesday, 24 June 2020

08.30-10.00	*Oral session 9* **AI and machine learning for optimisation of medical imaging**
08.30-09.15	*Invited speaker* **[O9-1] From image quality to care outcome – evolved optimisation process supported by AI/Deep Learning** Mika Kortesniemi (HUS Medical Imaging Center, University of Helsinki) *Finland*
09.15-09.30	**[O9-2] CT image denoising with a novel deep learning-based reconstruction technique: a phantom study** C Franck, P Deak , G Zhang and F Zanca *Belgium and Germany*
09.30-09.45	**[O9-3] The deep learning algorithm ConvIP for improvement of ^{177}Lu SPECT images reconstructed with sparse acquired projections** T Rydén, M van Essen, I Marin, J Svensson and P Bernhardt *Sweden*
09.45-10.00	**[O9-4] AI and deep learning in diagnostic radiology – is this the next phase of scientific and technological development?** B M Moores *United Kingdom*
10.00-10.10	**Presentation from exhibitors** Fujifilm Nordic

10.10-10.30	**Social and exhibitor interaction (see separate Zoom meeting)**

10.30-11.45	*Oral session 10* **Strategies for optimisation of medical imaging**
10.30-10.45	**[O10-1] Underexposures are a major image quality problem in musculoskeletal radiography** M Geijer *Sweden*
10.45-11.00	**[O10-2] Optimisation of computed tomography in an university hospital radiology department: how to manage change** J Brandberg, H Milde and A Thilander Klang *Sweden*
11.00-11.15	**[O10-3] Optimisation of examination protocols for computed tomography – a tentative working process** J Elgqvist, A Svalkvist and A Thilander Klang *Sweden*
11.15-11.30	**[O10-4] Aligning video- and structured data for imaging optimisation** J Ivarsson, A Almén, M Falkenberg, C Lundh and M Båth *Sweden*
11.30-11.45	**[O10-5] A model for evaluating the use of imaging in image guided interventional procedures - possible implications on optimisation of radiation protection** C Lundh, J Ivarsson, M Falkenberg, M Båth and A Almén *Sweden*

11.45-12.00	**Announcements and conference closing**

2020-03-05

Poster session 1 – Monday, 22 June 2020, 17.30-19.30

[P-1] Semi-automated 3D segmentation of pelvic region bones in CT volumes for the annotation of machine learning datasets
J Jeuthe, J C González Sánchez, M Magnusson, M Sandborg, Å Carlsson Tedgren and A Malusek
Sweden

[P-2] Segmentation of pelvic region bones in medical dual-energy computed tomography volumes using the 3D U-Net
J C González Sánchez, M Magnusson, M Sandborg, Å Carlsson Tedgren and A Malusek
Sweden

[P-3] Accuracy of CT numbers obtained by DIRA and Monoenergetic Plus algorithms in dual-energy computed tomography
A Malusek, M Magnusson, M Sandborg, G Alm Carlsson, L Henriksson and Å Carlsson Tedgren
Sweden

[P-4] Optimal selection of base materials for accurate dual-energy computed tomography: comparison between the Alvarez-Macovski method and DIRA
M Magnusson, G Alm Carlsson, M Sandborg, Å Carlsson Tedgren and A Malusek
Sweden

[P-5] On the possibility to resolve gadolinium- and cerium-based contrast agents from their CT numbers in dual-energy computed tomography
A Malusek, L Henriksson, P Eriksson, N Dahlström, Å Carlsson Tedgren and K Uvdal
Sweden

[P-6] Comparison of metal artefacts using different dual-energy CT techniques
E Pettersson, A Bäck and A Thilander-Klang
Sweden

[P-7] Investigation of a novel metric for direction of distortion power of nonlinear medical imaging algorithms
J Larsson, M Båth and A Thilander Klang
Sweden

[P-8] Creating an energy and angle independent 4π silicon dosemeter for quality control of CT/CBCT-using a CAD and MC simulation approach
L Herrnsdorf, M Andersson, M Gunnarsson and S Mattsson
Sweden

[P-9] Quantitative evaluation of a photon-counting mammography and direct-digital mammography unit prior to 3D imaging
T M Svahn, J Riffel, R Gordon and M Hartbauer
Sweden, Austria, Germany and USA

[P-10] Influence of arm positions on effective dose during CT scans of neck, chest, abdomen/pelvis on different CT units
T M Svahn and J C Ast
Sweden

[P-11] Performance of ultra-low dose computed tomography (CT), standard dose CT and digital radiography: an anthropomorphic lung phantom study
T M Svahn, T Sjöberg, K Shahgeldi and M Parenmark
Sweden

[P-12] Comparison and optimization of imaging techniques of multiple digital radiography systems for scoliosis
T M Svahn, K Shahgeldi, D Axbåge, D Dackell and M Stenström
Sweden

[P-13] **Evaluation of image quality of skull radiographs using European criteria for quality assessment as a reference guide**
D Z Joseph, A A Aminu, I Garba, M S Umar and S S Bature
Nigeria

[P-14] **The relationship between mean glandular dose and compressed breast thickness as a panacea for dose optimisation in mammography**
J Josephine, C C Nzotta, D Z Joseph
Nigeria

[P-15] **Quantification of pulmonary pathology in cystic fibrosis – comparison between digital chest tomosynthesis and computed tomography**
C Meltzer, M Gilljam, J Vikgren, R Rossi Norrlund, K Vult von Steyern, M Båth and Å Allansdotter Johnsson
Sweden and Norway

[P-16] **Comparison of two chest tomosynthesis cystic fibrosis scoring systems and High Resolution Computed Tomography Brody scoring**
R Rossi Norrlund, C Meltzer, C Söderman, Å Allansdotter Johnsson, J Vikgren, D Molnar, M Gilljam and M Båth
Sweden

[P-17] **Evaluation and optimization of image quality from the quality controls of digital radiography equipment in a diagnostic imaging service at Fundación Valle del Lili**
E J Durán, S Benavides, E Ramirez, R Chamorro, A Quiroga and W Lopera
Colombia

Poster session 2 – Tuesday, 23 June 2020, 17.30-19.30

[P-18] **Radiological implications of radiation dose distribution in paediatric patients undergoing diagnostic x-ray examination in some Nigerian teaching hospitals**
C A Aborisade
Nigeria

[P-19] **Dose evaluation and proposal of local diagnostic reference levels in paediatric cardiac catheterization**
M Hultenmo, A Nygren, B Söderberg and H Wåhlander
Sweden

[P-20] **Establishment of diagnostic reference levels for radiography examinations in Bosnia and Herzegovina: results from IAEA project**
A Beganović, A Drljević, I Lasić, S Galić, E Đedović, L Ibrišimović, J Davidović, G Vuleta, A Nuhan, A Duraković, J Praskalo, J Marinković and J Vassileva
Bosnia and Herzegovina and Austria

[P-21] **Establishment of diagnostic reference levels for computed tomography in Bosnia and Herzegovina: results from IAEA project**
A Beganović, A Drljević, I Lasić, S Galić, E Đedović, L Ibrišimović, J Davidović, G Vuleta, A Nuhan, A Duraković, J Praskalo, J Marinković and J Vassileva
Bosnia and Herzegovina and Austria

[P-22] **Exposure of the Swiss population in 2018 by medical X-rays**
A Viry, J Bize, P R Trueb, B Ott, S Schindera, D Racine, F R Verdun and R LeCoultre
Switzerland

[P-23] Patient doses and optimisation in common dental radiographic and panoramic examinations
I Shatskiy
Russian Federation

[P-24] Influence of the patient weight on the conversion coefficients from dose-area product to the effective dose
V Golikov
Russian Federation

[P-25] Evaluation of radiation doses using cone beam computed tomography in endovascular aortic repair and scoliosis procedures
L Strandberg, P Jonasson and M Larsson
Sweden

[P-26] Assessment of patient's and occupational exposure from PET/CT with various radiopharmaceuticals
H Salah, F H Mayhoub, A Sulieman, H I Al-Mohammed, M Alkhorayef and B Moftah
Saudi Arabia, Sudan and United Kingdom

[P-27] The potential to use TLD measurements in purpose to validate the occupational radiation protection at the department of nuclear medicine
I Nilsson, J Himmelman, J Khan and J Dalmo
Sweden

[P-28] A survey of occupational eye dose levels measured at collar height in image-guided interventions – a method for monitoring and identification of the requirement of more accurate measurements
M Larsson, P Jonasson and C Lundh
Sweden

[P-29] Evaluation of annual radiation exposure in cardiac catheterization department in Saudi Arabia
A Sulieman, F Mayhoub, H Salah, M Alkhorayef, H Al-mohammed and B Moftah
Saudi Arabia

[P-30] Staff dose evaluation by application of radiation protection during ERCP procedures performed with a mobile C-arm
A Österlund, W Drohn, H Hödlmoser, M Greiter, M Schmid and H-E Källman
Sweden and Germany

[P-31] Radiation leakage in two CT rooms due to construction failure
M Bergfjord and A Mamour
Sweden

[P-32] High-sensitive biomarkers of blood total antiradical activity in mice exposed to gamma irradiation
T Sanikidze, G Ormotsadze, I Chkhikvishvili, E Shekiladze, M Gogebashvili, E Lomadze and M Buleishvilii
Georgia

[P-33] Offline adaptive radiation therapy in the treatment of head and neck cancer using MIMvista Software
Y Herrassi, Y Raoui, S Moujahid, S Jebbari, R Sebihi and K Tanouti
Morocco

[P-34] Evaluation of Iterative Model-Based Reconstruction (IMR) in abdominal Computed Tomography imaging at two different dose levels
E Hettinger, M-L Aurumskjöld, H Sator, F Holmquist, D Svärd and P Timberg
Sweden