

The Wizardry of Artificial Intelligence

AI and Machine Learning
in Cancer Imaging

Free registration

www.icimagingociety.org.uk

17 & 18 May, 2019

Champalimaud Foundation
Lisbon, Portugal

Speakers & Chairs:

Andrea Rockall, London, UK (Organising committee)
Celso Matos, Lisbon, Portugal (Organising committee)
Charles Kahn, Pennsylvania, USA
Dow-Mu Koh, London, UK (Organising committee)
Eric van Cutsem, Leuven, Belgium
Evis Sala, Cambridge, UK (Organising committee)
Fred Prior, Arkansas, USA (Organising committee)
Heinrich von Busch, Erlangen, Germany
Jayshree Kalpathi-Cramer, Boston, USA
João Santinha, Lisbon, Portugal
Jorge Soares, Lisbon, Portugal
Luis Martí-Bonmatí, Valencia, Spain (Organising committee)
Maryellen Giger, Chicago, USA
Nickolas Papanikolaou, Lisbon, Portugal (Organising committee)
Nicola Strickland, London, UK
Rowland Illing, London, UK
Sandy Napel, Stanford, USA
Seong Ki Mun, Arlington, USA (Organising committee)
Stefan Wijnen, Cambridge, UK
Tanveer Syeda-Mahmood, San Jose, USA
Ulrich Bick, Berlin, Germany

Organisation:



Champalimaud
Foundation

17 - 18 May
2019
Lisbon, Portugal

Dear colleagues and friends,

On behalf of the Champalimaud Foundation and the International Cancer Imaging Society, we would like to invite you to attend this special focus multidisciplinary meeting on the development and application of artificial intelligence (AI) and machine learning (ML) in Cancer Imaging.

AI and ML are set to have a deep impact on how radiologists, as well as clinicians, may work in the future. However, there has been limited opportunities for imagers, scientists, clinicians and industrial partners to interact, so as to understand clinical needs, to identify common goals and to prioritise developments.

This meeting will bring together specialists in oncology, cancer imaging, AI and ML, as well as industry members to present and discuss these issues. We welcome your participation in our program and look forward to seeing you in Lisbon!

Celso Matos, Dow-Mu Koh and Fred Prior
On behalf of the organising committee*

Scientific Programme

17 May

2019

Lisbon, Portugal

In this session we will discuss the challenges that cancer imaging faces and describe the eventual state of cancer imaging and imaging service that should be reached in the future. We will also describe the problems that AI techniques might be able to address.

In the technology session we will analyse the technology of AI and deep learning and address the assumptions and limitation of the current tools. We will discuss current bottlenecks in image annotation/ data curation, as well as potential approaches using smaller datasets.

8:30 Registration

9:00 Welcome session

9:15 Session 1: Reviewing the Clinical Challenges

Chair: Andrea Rockall, London, UK

09:15 Attitudes and perceptions of AI and Machine Learning in cancer imaging: findings of an international survey.

(Dow-Mu Koh, London, UK)

09:35 Clinical challenges in Diagnostic Radiology: From workflow to integrated diagnostics.

(Evis Sala, Cambridge, UK)

09:55 How can AI be harnessed to enhance cancer imaging?

(Charles Kahn, Pennsylvania, USA)

10:15 Discussions

10:35 - 11:00 Coffee Break

11:00 Session 2: Theory and practice of technology of AI and Deep Learning

Chair: Seong Ki Mun, Arlington, USA

11:00 Perspectives on AI and machine learning developments in Cancer Imaging.

(Maryellen Giger, Chicago, USA)

11:25 Image annotation and data curation.

(Jayshree Kalpathi-Cramer, Boston, USA)

11:50 AI and Machine Learning techniques for smaller datasets.

(Nickolas Papanikolaou, Lisbon, Portugal)

12:15 Discussions

Scientific Programme

17 May

2019

Lisbon, Portugal

12:30 [Session lecture: Ethics in AI and Machine Learning](#)

Chair: Celso Matos, Lisbon, Portugal

(Jorge Soares, The National Council of Legal Medicine & National Council of Ethics for Life Sciences, Lisbon, Portugal)

13:00 - 14:00 Lunch

14:00 [Session 3: Lessons learned in cancer imaging AI](#)

Chair: Evis Sala, Cambridge, UK

14:00 Challenges of developing tools for tumour definition and segmentation.

(Stefan Wijnen, Cambridge, UK)

14:20 Computer aided diagnoses: lessons from breast imaging.

(Ulrich Bick, Berlin, Germany)

14:40 Using imaging datasets for machine learning: reality and challenges.

(Andrea Rockall, London, UK)

15:00 How to use retrospective data from biobanks and repositories.

(Luis Martí-Bonmatí, Valencia, Spain)

15:20 Discussions

15:40 - 16:00 Coffee Break

Computer-aided diagnoses have been available for many years and promising products were offered, but dramatic changes in clinical practice have not taken place. What lessons have we learned? What issues should be addressed to have a clinically relevant AI/DL?



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17 May

2019

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What are the requirements in data curation, software, hardware, database, data base management, human engineering and others to develop large-scale AI/ML capabilities?

16:00 Session 4: Technical ecosystem necessary to develop next generation AI/ML capabilities

Chair: Nickolas Papanikolaou, Lisbon, Portugal

16:00 Data curation and quantitative analysis – NCI's cancer imaging archive.

(Fred Prior, Arkansas, USA)

16:25 Role of open source and open collaboration for imaging AI.

(Seong Ki Mun, Arlington, USA)

16:50 Radiomics pipelines and the cancer data ecosystem.

(Sandy Napel, Stanford, USA)

17:15 Discussion

17:30 - 19:00 End of 1st day Cocktail

Scientific Programme

18 May

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The technology will deliver solutions. What can we expect when AI/ML tools become effective? What are possible intended and unintended consequences? How should an ecosystem evolve to take advantage of new tools? How would we train future professionals? What are the legal and ethics fallout?

8:30 Session 5: Clinical and industrial ecosystem to take advantage of emerging AI/DL

Chair: Dow-Mu Koh, London, UK

8:30 Promise of AI in imaging: an industry perspective (Heinrich von Busch, Erlangen, Germany)

8:50 Integrating AI into imaging software solutions (Tanveer Syeda-Mahmood, San Jose, USA)

9:10 The application of AI in healthcare systems (Rowland Illing, London, UK)

9:30 Training the workforce: opportunities and challenges

(Nicola Strickland, President of the Royal College of Radiologist, London, UK)

9:50 Discussions

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A multidisciplinary panel will discuss and debate goals and priorities for AI and ML in cancer imaging.

This workshop will show how to setup a radiomics service/ laboratory in the clinical environment. 10 computers will be used to run scripts for developing radiomic signatures on anonymised imaging data in the field of rectal, prostate and breast cancer. The concepts of preprocessing, segmentation, feature engineering, model training, validation and testing with external data will be covered.

10:10 Session lecture: Common unmet clinical needs and challenges for cancer imaging: a clinical perspective
(Chair: Dow-Mu Koh)

(Eric van Cutsem, Leuven, Belgium)

10:40 - 11:10 Coffee Break

11:10 Session 6: Multidisciplinary discussion: how to road-map the development of AI and Machine Learning for cancer imaging?

(Chairs: Celso Matos and Fred Prior)

11:10 Live panel discussion with participants invited from academia and clinical practices

(Andrea Rockall, London, UK)

(Celso Matos, Lisbon, Portugal)

(Charles Kahn, Pennsylvania, USA)

(Eric van Cutsem, Leuven, Belgium)

(Fred Prior, Arkansas, USA)

(Jorge Soares, Lisbon, Portugal)

(Sandy Napel, Stanford, USA)

12:40 Closing remarks and lunch

14:00 Session 7: Hands-on radiomics

Conducted twice, each limited to only 20 participants.

(Nickolas Papanikolaou & João Santinha, Lisbon, Portugal)

Registration for the workshops will open on-site.

Look out for the announcements.



Notes





Organising Committee

Celso Matos, Dow-Mu Koh, Fred Prior, Nickolas Papanikolaou, Andrea Rockall, Seong Ki Mun, Luis Martí-Bonmatí, Evis Sala

Registration dates

Until 15 May Free Registration

Registration form available at www.icimatingsociety.org.uk

Venue

Champalimaud Centre for the Unknown
Av. de Brasília
1400-038, Lisboa, Portugal

Official language

English. No translation system available.

Travel and accommodation

Travel and hotel arrangements are the responsibility of the participants.