



MICN Lab

USZ Universitäts
Spital Zürich



University of
Zurich^{UZH}



First

Zurich Machine Intelligence in Clinical Neuroscience Symposium

Understand the Present, Foresee the Future

Sponsored by: B. Braun Medical

Thursday, January 21st 2021

8:30 a.m. – 6:30 p.m. GMT +1 (Zurich)

2:30 a.m. – 12:30 p.m. EST (New York)

11:30 p.m. – 9:30 a.m. PST (Los Angeles)

6:30 p.m. – 4:30 a.m. GMT +11 (Sydney)

[Registration – Click Here](#)

[Zoom Link – Join – Click Here](#)

The event will be held **online over Zoom**. You will receive the Zoom link and further information after registering using the abovementioned form. **Registration and participation are completely free of charge!** A recording of the symposium will be made available on the MICN Lab website (www.micnlab.com)

Director

Luca Regli

Organizers

Victor Staartjes

Carlo Serra

Machine Intelligence in Clinical Neuroscience (MICN) Laboratory
Department of Neurosurgery & Clinical Neuroscience Center
University Hospital Zurich, University of Zurich

Keynote Speakers

Emanuela Keller (Zurich, Switzerland)
Walter C. Jean (Washington, USA)

Michael E. Ivan (Miami, USA)
Friedrich F. Reinhard (Lausanne, Switzerland)

Invited Faculty

Antonio Di Ieva (Sydney, Australia)
Tiit Mathiesen (Copenhagen, Denmark)
Julius M. Kernbach (Aachen, Germany)
Emmanuel Mandonnet (Paris, France)
Timothy Hamann (Zurich, Switzerland)
Bas van Niftrik (Zurich, Switzerland)
Nicolai Maldaner (Zurich, Switzerland)
Andrew Schilling (Baltimore, USA)
G. Damien Brusko (Miami, USA)
Quinlan D. Buchlak (Sydney, Australia)
Antonios K. Thanellas (Helsinki, Finland)
Gustav Burström (Stockholm, Sweden)
Pavan Shah (Baltimore, USA)

Tristan van Doormaal (Zurich, Switzerland)
Risto Grkovski (Zurich, Switzerland)
Hendrik-Jan Mijderwijk (Düsseldorf, Germany)
Michael C. Jin (Stanford, USA)
Leah Voytovich (Philadelphia, USA)
Eddie De Dios (Gothenburg, Sweden)
Adrian Jimenez (Baltimore, USA)
Vittorio Stumpo (Zurich, Switzerland)
Moumin Mohamed (London, UK)
Marc Ungeheuer (Aachen, Germany)
Christopher Rösel (Aachen, Germany)
Max Brzezicki (Oxford, UK)
Michael Leung (Toronto, Canada)



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Program

Time (GMT +1)	Title	Presenter	Institution
8:30 – 8:40 a.m.	Welcome	Luca Regli Carlo Serra	MICN Lab, Neurosurgery University Hospital Zurich (CH)
8:40 – 9:05 a.m.	Introduction: Machine Learning Terminology and Basics	Victor Staartjes	MICN Lab, Neurosurgery University Hospital Zurich (CH)
Session I:			
Implementing Machine learning in Neuroimaging and Electronic Health Records			
<i>Session Chair:</i> Antonio Di Ieva (Sydney, Australia)			
<i>Moderators:</i> Julius M. Kernbach, Victor Staartjes, Carlo Serra			
9:10 – 9:25 a.m.	Foundations of Multiparametric Brain Tumor Imaging Characterization	Sidong Liu	Macquarie University (AU)
9:25 – 9:40 a.m.	Natural Language Processing in Clinical Neuroscience	Quinlan D. Buchlak	University of Notre Dame (AU)
9:40 – 9:55 a.m.	Foundations of Machine Learning-Based Neuroimaging Segmentation	Antonios K. Thanellas	Helsinki University Hospital (FI)
9:55 – 10:10 a.m.	Neuroimaging Classification in Python: A Primer	Moumin Mohamed	Royal London Hospital (UK)
10:10 – 10:25 a.m.	Lesion-Symptom Mapping Using Machine Learning	Emmanuel Mandonnet	Lariboisière Hospital Paris University of Paris-Saclay (FR)
10:25– 10:55 a.m.	Keynote Session: <i>Intermezzo:</i> Wildlife Protection in Africa using Drones and Machine Learning	Friedrich F. Reinhard Marc Ungeheuer Christopher Rösel	EPFL Lausanne (CH) RWTH Aachen (DE)
10:55 – 11:15 a.m. Break			
Session II:			
Applying Machine Intelligence in Daily Clinical Practice: Strengths and Limitations			
<i>Session Chair:</i> Tiit Mathiesen (Copenhagen, Denmark)			
<i>Moderators:</i> Carlo Serra, Victor Staartjes			
11:15 – 11:30 a.m.	Ethical Issues and AI	Tiit Mathiesen	University of Copenhagen (DK)
11:30 – 11:45 p.m.	The AI Doctor – Considerations for AI-Based Medicine	Julius M. Kernbach	RWTH Aachen University Hospital (DE)
11:45 – 12:00 p.m.	AI-assisted AR: From Bench to Bedside	Tristan van Doormaal	Neurosurgery University Hospital Zurich (CH)
12:00 – 12:15 p.m.	History of Machine Learning in Neurosurgery	Andrew Schilling Pavan Shah	Johns Hopkins University (USA)
12:15 – 1:00 p.m. Break			



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Time (GMT +1)	Title	Presenter	Institution
Session III:			
Spectrum of Clinical Applications of Machine Learning in Clinical Neuroscience			
<i>Session Chair:</i> Carlo Serra (Zurich, Switzerland)			
<i>Moderators:</i> Victor Staartjes, Julius M. Kernbach			
1:00 – 1:15 p.m.	Machine Learning and COVID-19: The Evidence	Max Brzezicki	University of Oxford (UK)
1:30 – 1:45 p.m.	Big Data in Clinical Neuroscience	G. Damien Brusko	University of Miami (USA)
1:45 – 2:00 p.m.	Machine Vision for Intraoperative Anatomical Recognition	Michael Leung	7D Surgical, Toronto (CA)
2:00 – 2:30 p.m.	Keynote Session: Machine Learning in Brain Tumor Surgery	Michael E. Ivan	University of Miami (USA)
2:30 – 2:45 p.m. Break			
Session IV:			
How Does Machine Learning Work? Methodological Foundations			
<i>Session Chair:</i> Julius M. Kernbach (Aachen, Germany)			
<i>Moderators:</i> Tristan van Doormaal, Victor Staartjes			
2:45 – 3:00 p.m.	Overview of Algorithms for Clinical Prediction Modeling	Michael C. Jin	Stanford University (USA)
3:00 – 3:15 p.m.	A Primer on Deep Learning	Eddie De Dios	University of Gothenburg (SE)
3:15– 3:30 p.m.	Introduction to Bayesian Modeling	Gustav Burström	Karolinska Institute (SE)
3:30– 3:45 p.m.	Deploying Clinical Prediction Models	Adrian Jimenez	Johns Hopkins University (USA)
3:45 – 4:00 p.m.	Tackling Natural Language Processing Problems: Practical Perspective	Leah Voytovich	University of Pennsylvania (USA)
4:00 – 4:30 p.m.	Keynote Session: <i>Intermezzo:</i> Virtual Reality in Skull Base Surgery	Walter C. Jean	George Washington University (USA)
4:30 – 4:45 p.m. Break			

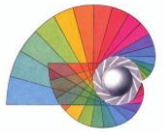


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Session V:			
Machine Learning at the University Hospital Zurich: What We Have Achieved So Far			
<i>Session Chair: Luca Regli (Zurich, Switzerland)</i>			
<i>Moderators: Carlo Serra, Victor Staartjes</i>			
4:45– 5:00 p.m.	Dynamic outcome prediction in subarachnoid hemorrhage	Nicolai Maldaner	Neurosurgery University Hospital Zurich (CH)
5:00 – 5:15 p.m.	Lesion detection in Neuroimaging Using Machine Learning	Risto Grkovski	Neuroradiology University Hospital Zurich (CH)
5:15 – 5:30 p.m.	At the pulse of time: Machine vision in retinal videos	Timothy Hamann	Ophthalmology University Hospital Zurich (CH)
5:30 – 5:45 p.m.	Machine Learning-Based Prediction of Complications after Brain Tumor Surgery	Bas van Niftrik	MICN Lab, Neurosurgery University Hospital Zurich (CH)
5:45 – 6:00 p.m.	Machine Learning in Pituitary Surgery	Vittorio Stumpo	MICN Lab, Neurosurgery University Hospital Zurich (CH)
6:00 – 6:30 p.m.	Keynote Session: AI in the Neuro-ICU	Emanuela Keller	Neuro-ICU University Hospital Zurich (CH)
6:30 p.m.	Closing Remarks	Luca Regli Carlo Serra	MICN Lab, Neurosurgery University Hospital Zurich (CH)