

15 Jan – 31 Mar 2021

Online for 2 months

THE PROMISES AND DARK SIDES OF ARTIFICIAL INTELLIGENCE IN NMR, MRI AND NEUROSCIENCE

Online Workshop

gidrm2020.uniroma2.it

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TOPICS

- Hardware and sequence design through AI
- AI for image reconstruction
- AI for image analysis and statistical inference
- Interpretability and Explainability
- Clinical Applications
- Current challenges and future perspectives

PRACTICAL INFO

- **Jan 15th – Mar 31st, 2021 – Asynchronous Workshop:** All talks will be recorded in advance and available anytime to all attendees and speakers. Every talk will be coupled to a **virtual discussion room** for asynchronous Q&A at gidrm2020.uniroma2.it
- **Feb 19th, 2021 – Live Workshop:** Talks will be presented or reproduced in presence of the speakers (see detailed program). **This is your chance to meet the speakers, ask your questions LIVE and discuss your collaborative ideas!**
- **Registration** (deadline: Feb 14, 2021) will be handled thorough GIDRM – click [here](#) to register.
- **Fees:** Free for 2020 GIDRM members. GIDRM Membership is € 35 (\$41) for non-GIDRM members - € 20 (\$25) if you are aged under 28. Includes 1-year GIDRM membership (valid through 2021) and free access to all 2021 GIDRM days and school held online.
- **30 ECM credits included** for Medical Doctors, Physicists, Chemists (National Italian Health System), accreditation provided by [biomedica](#) (accessible Feb 19th-March 31st)

Local Organizing Committee

Prof. Nicola Toschi – Prof. Maria Guerrisi – Dr. Andrea Duggento
Dr. Allegra Conti – Dr. Silvia Minosse- Dr. Francesco Di Cio-Dr. Antonio Canichella

Scientific Committee

Marco Geppi – Marcello Alecci – Silvia Borsacchi – Mariapina D'Onofrio
Simonetta Geninatti Crich – Giacomo Parigi – Giuseppe Pileio
Nicola Toschi – Maria Guerrisi – Francesco G. Garaci – Roberto Floris
Federico Giove – Andrea Duggento – Allegra Conti – Silvia Minosse- Francesco Di Cio



Asynchronous Workshop (accessible Jan 15th - March 31st 2020)

Marco Geppi – University of Pisa (Italy) - Opening remarks	
Nicola Toschi – University of Rome Tor Vergata (Italy) - Welcome and introduction to the workshop	
Andrea Duggento – University of Rome Tor Vergata (Italy) - Focused introduction to deep learning for biomedical applications	
Hardware and sequence design through AI <p>Keynote Lectures</p> <p>Florian Knoll – NYU Langone Health (United States) – <i>"Potential and potential pitfalls of AI for the diagnostic MRI pipeline"</i></p> <p>Jongho Lee – Seoul National University (Republic of Korea) – <i>"Deep Designed RF"</i></p> <p>Oral Communications</p> <p>Manu Veliparambil Subrahmanian/Gianluigi Veglia – University of Minnesota (United States) – <i>"Artificial Intelligence in RF Pulse Design: from High Resolution NMR to Imaging"</i></p> <p>Mads Sloth Vinding – Aarhus University (Denmark) – <i>"Optimal and DeepControl in MRI pulse sequence"</i></p>	AI for image reconstruction <p>Keynote Lectures</p> <p>Andreas Maier – Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany) – <i>"Known Operator Learning - An approach to unite machine learning, signal processing, and physics"</i></p> <p>Jong Chul Ye – Korea Advanced Institute of Science and Technology (Republic of Korea) – <i>"Unsupervised deep learning for MR reconstruction using physics-informed cycleGAN"</i></p> <p>Oral Communications</p> <p>Vegard Antun – University of Oslo (Norway) – <i>"AI generated hallucinations in the sciences - On the stability accuracy trade-off in deep learning"</i></p> <p>Mehmet Akcakaya – University of Minnesota (United States) – <i>"Self-Supervised Deep Learning of MRI Reconstruction without Reference Data"</i></p> <p>Enhao Gong – Stanford University (United States) – <i>"tbc"</i></p>
AI for image analysis and statistical inference <p>Keynote Lectures</p> <p>Chen Qin – The University of Edinburgh (United Kingdom) – <i>"Deep Learning for Dynamic MRI Reconstruction"</i></p> <p>Daniel Remondini / Gastone Castellani – Bologna University (Italy) – <i>"Artificial Intelligence in MRI: from raw data to analysis"</i></p> <p>Oral Communications</p> <p>Guy Gaziv – Weizmann Institute of Science (Israel) – <i>"Self-Supervised Natural Image Reconstruction and Rich Semantic Classification from Brain Activity"</i></p> <p>Marco Palombo – University College London (United Kingdom) – <i>"Machine Learning Applications to Microstructure Imaging through Diffusion MRI"</i></p> <p>Tiago Azevedo – University of Cambridge (United Kingdom) – <i>"A Deep Graph Neural Network Architecture for rs-fMRI Data"</i></p> <p>Mike Germuska – Cardiff University (United Kingdom) – <i>"Robust estimation of cerebral oxygen metabolism with machine learning"</i></p> <p>Giovanna Maria Dimitri – Università degli Studi di Siena (Italy) – <i>"Brain MRI segmentation and reconstruction. A Deep Learning perspective"</i></p> <p>Simeon Spasov – University of Cambridge (United Kingdom) – <i>"Overcoming the challenges of data paucity in deep learning for neuroimaging"</i></p>	Interpretability and Explainability <p>Keynote Lectures</p> <p>Paul Rad – The University of Texas at San Antonio (United States) – <i>"Explainable and Robust Deep Learning for Medical Domain"</i></p> <p>Oral Communications</p> <p>Riccardo Guidotti – University of Pisa (Italy) – <i>"Explaining Explanation Methods: from LIME to DoctorXAI"</i></p> <p>David Schneeberger – University of Vienna (Austria) – <i>"Quo vadis Europe? A comparative outlook at proposed explainability regulation"</i></p>
Current challenges and future perspectives <p>Keynote Lectures</p> <p>Donatello Apollunio Gassi – Amazon Web Services (AWS), Giuseppe Leonardo Cascella – Idea75 – <i>"Unstructured data, ML and AI for healthcare and industry 4.0 applications"</i></p> <p>Roberto Basili – University of Rome Tor Vergata (Italy) – <i>"Interpretability and Explainability in Machine Learning: lesson learnt, challenges and directions from a NLP perspective"</i></p> <p>Stefano Diciotti – Bologna University (Italy) – <i>"Current challenges and future perspectives of machine learning techniques in medical imaging"</i></p> <p>Oral Communications</p> <p>Fabio Massimo Zanzotto – University of Rome Tor Vergata (Italy) – <i>"Clinician-in-the-loop AI: for a fairer model of clinical knowledge exploitation"</i></p> <p>Marcello Cadioli – Philips Healthcare (Italy) – <i>"AI for MRI: An industrial perspective and outlook"</i></p> <p>Birgi Tamersoy – Siemens Healthcare (Italy) – <i>"AI for healthcare"</i></p>	AI for neuroscience and clinical applications <p>Keynote Lectures</p> <p>Duygu Tosun-Turgut – San Francisco Veterans Affairs Medical Center (United States) – <i>"Impact of AI and deep learning on imaging of neurodegenerative diseases"</i></p> <p>Hugo Aerts – Harvard Medical School, Boston (United States) – <i>"Artificial Intelligence in Cancer Imaging"</i></p> <p>Federica Agosta – Vita-Salute San Raffaele University (Italy) – <i>"Artificial intelligence for early diagnosis and clinical decision making in neurodegenerative disorders"</i></p> <p>Hugo G. Schnack – UMC Utrecht (Netherlands) – <i>"AI for psychiatric imaging: promises and challenges"</i></p> <p>Maryellen L. Giger – The University of Chicago (United States) – <i>"Machine Learning on MRI of Breast Cancer"</i></p> <p>Oral Communications</p> <p>Allegra Conti – University of Rome Tor Vergata (Italy) – <i>"Dissecting the progression of multiple sclerosis through explainable ML techniques"</i></p> <p>Antonio Maria Chiarelli – G. D'Annunzio University (Italy) – <i>"A Machine Learning Framework for Assessing the Effect of Prematurity on MRI Metrics of Functional Connectivity and Regional Brain Structure"</i></p> <p>Patrick Bolan – University of Minnesota (United States) – <i>"Improving Advanced Imaging Workflows with AI"</i></p> <p>Tommaso Banzato – University of Padova (Italy) – <i>"Clinical Applications of AI in Diagnostic Imaging"</i></p> <p>Claudio Luchinat – University of Florence (Italy) – <i>"Predictive models from metabolomic data"</i></p>

Live workshop Feb 19th – (8.30- 18.30 CET see detailed programme)

Talks will be presented or reproduced in presence of the speakers for realtime Q&A and discussion and networking. The workshop will end with a live round table.