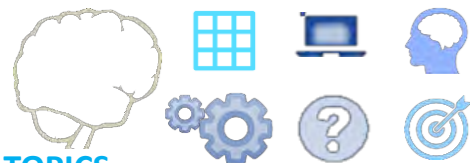


15 Jan – 31 Mar 2021

Online for 2 months

gidrm2020.uniroma2.it



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

The primary goal of this workshop is to bring together the diverse but overlapping communities of physicists, chemists, computer scientists, biologists, clinicians and neuroscientists to explore novel, out-of-the box angles through which trans-disciplinary challenges in NMR, MRI and neuroscience research and technology can be tackled using Artificial Intelligence. This will include proposing a vision of the most promising directions and short/mid-term future scientific, technological, ethical and regulatory synergies.

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 @ www.gidrm.org
- **Fees: Free for 2020 GIDRM members, € 35 (\$41) for non-GIDRM members. 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 biomedia (accessible Feb 19^o-March 31^o)

Local Organizing Committee

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

Scientific Committee

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



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

Prof. Marco Geppi – University of Pisa (Italy) - Opening remarks

Prof. 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

Keynote Lectures

Prof. Florian Knoll – NYU Langone Health (United States) – "Potential and potential pitfalls of AI for the diagnostic MRI pipeline"
Prof. Jongho Lee – Seoul National University (Republic of Korea) – "Deep Designed RF"

Oral Communications

Prof. Gianluigi Veglia – University of Minnesota (United States) – "Artificial Intelligence in RF Pulse Design: from High Resolution NMR to Imaging"
Prof. Mads Sloth Vinding – Aarhus University (Denmark) – "Optimal and DeepControl in MRI pulse sequence"

AI for image analysis and statistical inference

Keynote Lectures

Prof. Danilo Bzdok – McGill University (Canada) - "Thoughts on the inference-prediction dilemma in big biomedical data"
Prof. Daniel Remondini / Prof. Gastone Castellani – Bologna University (Italy) "Artificial Intelligence in MRI: from raw data to analysis"

Oral Communications

Guy Gaziv - Weizmann Institute of Science (Israel) – "Self-Supervised Natural Image Reconstruction and Rich Semantic Classification from Brain Activity"
Marco Palombo – University College London (United Kingdom) - "Machine Learning Applications to Microstructure Imaging through Diffusion MRI"
Tiago Azevedo – University of Cambridge (United Kingdom) - "A Deep Graph Neural Network Architecture for rs-fMRI Data"
Mike Germuska – Cardiff University (United Kingdom)
Giovanna Maria Dimitri – Università degli Studi di Siena (Italy)- "Brain MRI segmentation and reconstruction. A Deep Learning perspective"
Simeon Spasov – University of Cambridge (United Kingdom)- "Overcoming the challenges of data paucity in deep learning for neuroimaging"
Chen Qin - The University of Edinburgh (United Kingdom) -"Deep Learning for Dynamic MRI Reconstruction"

Current challenges and future perspectives

Keynote Lectures

Dr. Donatello Apollusion Gassi – Amazon Web Services (AWS),
Dr. Giuseppe Leonardo Cascella – Idea75 "Unstructured data, ML and AI for healthcare and industry 4.0 applications"
Prof. Roberto Basili – University of Rome Tor Vergata (Italy)
Prof. Stefano Diciotti – Bologna University (Italy)- "Current challenges and future perspectives of machine learning techniques in medical imaging"

Oral Communications

Prof. Fabio Massimo Zanzotto – University of Rome Tor Vergata - "Clinician-in-the-loop AI: for a fairer model of clinical knowledge exploitation"
Marcello Cadioli - Philips Healthcare (Italy) "AI for MRI: An industrial perspective and outlook"
Birgi Tamersoy – Siemens Healthcare (Italy) - "AI for healthcare" (tbc)

AI for image reconstruction

Keynote Lectures

Prof. Andreas Maier – Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany) "Known Operator Learning - An approach to unite machine learning, signal processing, and physics"
Prof. Jong Chul Ye – Korea Advanced Institute of Science and Technology (Republic of Korea) - "Unsupervised deep learning for MR reconstruction using physics-informed cycleGAN"

Oral Communications

Prof. Anders Hansen – University of Cambridge (United Kingdom) - "AI generated hallucinations in the sciences - On the stability accuracy trade-off in deep learning - Part I"
Vegard Antun – University of Oslo (Norway) - "AI generated hallucinations in the sciences - On the stability accuracy trade-off in deep learning - Part II"
Prof. Mehmet Akcakaya – University of Minnesota (United States) - "Recent Advances in Self-Supervised Learning of MRI Reconstruction without Reference Data"
Enhao Gong – Stanford University (United States)



Interpretability and Explainability

Keynote Lectures

Prof. Paul Rad – The University of Texas at San Antonio (United States)

Oral Communications

Andrea Duggento – University of Rome Tor Vergata (Italy) – "Key concepts and taxonomies in Explainable Artificial Intelligence: what do we want to explain and why?"
Riccardo Guidotti – University of Pisa (Italy) – "Explaining Explanation Methods: from LIME to DoctorXAI"
David Schneeburger – University of Vienna (Austria) – "Quo vadis Europe? A comparative outlook at proposed explainability regulation"



AI for neuroscience and clinical applications

Keynote Lectures

Prof. Duygu Tosun-Turgut – San Francisco Veterans Affairs Medical Center (United States) - "Impact of AI and deep learning on imaging of neurodegenerative diseases"
Prof. Hugo Aerts – Harvard Medical School, Boston (United States) - "Artificial Intelligence in Cancer Imaging"
Prof. Federica Agosta – Vita-Salute San Raffaele University (Italy) - "Artificial intelligence for early diagnosis and clinical decision making in neurodegenerative disorders"
Prof. Hugo G. Schnack – UMC Utrecht (Netherlands) - "AI for psychiatric imaging: promises and challenges"
Prof. Maryellen L. Giger – The University of Chicago (United States) "Machine Learning in cancer and COVID-19 imaging"

Oral Communications

Allegra Conti – University of Rome Tor Vergata (Italy) - "Dissecting the progression of multiple sclerosis through explainable ML techniques"
Antonio Maria Chiarelli – G. D'Annunzio University (Italy) - "A Machine Learning Framework for Assessing the Effect of Prematurity on MRI Metrics of Functional Connectivity and Regional Brain Structure"
Prof. Patrick Bolan – University of Minnesota (United States) - "Improving Advanced Imaging Workflows with AI"
Tommaso Banzato – University of Padova (Italy) - "The role of AI in clinical radiology"
Prof. Claudio Luchinat – University of Florence (Italy) - "Predictive models from metabolomic data"

Live workshop Feb 19th – (8.30- 18.30 CET see detailed programme, available after Jan 15, 2021)

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.

19 Feb. 2021
8.30 - 18:30 CET

LIVE

gidrm2020.uniroma2.it info@gidrm2020.uniroma2.it

LIVE SESSIONS –Feb 19th, 2021

This is your chance to meet the speakers, ask your questions LIVE and discuss your collaborative ideas!

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- **30 ECM credits included** for Medical Doctors, Physicists, Chemists, see AGENAS for full list (National Italian Health System)

Welcome and Opening
 (8.30 Room:)

Prof. Marco Geppi - University of Pisa (Italy) - **Opening remarks**

Prof. Nicola Toschi – University of Rome Tor Vergata (Italy) - **Welcome and introduction to the workshop**

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Hardware and sequence design through AI
 (Moderators: Allegra Conti – Federico Giove . Room:)

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 Birgi Tamersoy – Siemens Healthcare (Italy) - **"AI for healthcare"** (tbc)

Round Table (Prof. Nicola Toschi – Moderator, Room:)

All Keynotes – Invited Speakers – Attendees

Closure and Adjourment (Room:)

Prof. Marco Geppi – University of Pisa (Italy)