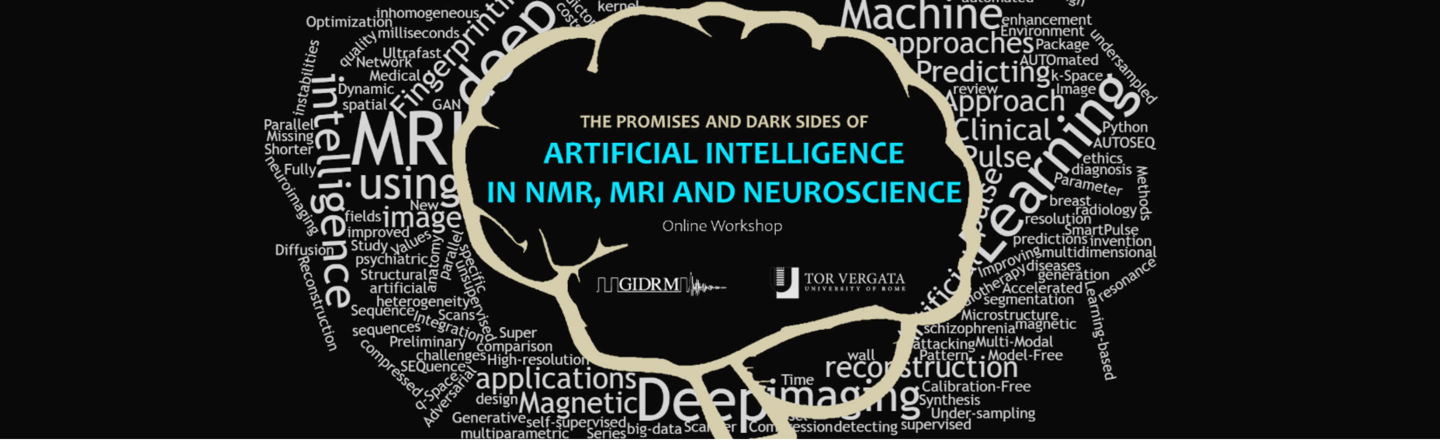

Abstract Book

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Speakers List

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Akcakaya Mehmet, Dr. (United States)
Antun Vegard, Dr. (Norway)
Azevedo Tiago, Mr. (United Kingdom)
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Toschi Nicola, Prof. (Italy)
Tosun Duygu, Dr. (United States)
Veliparambil Subrahmanian Manu, Dr. (United States)
Vinding Mads, Prof. (Denmark)
Ye Jong Chul, Prof. (Republic of Korea)
Zanzotto Fabio Massimo, Prof. (Italy)

Index

Introductury presentations

Hardware and sequence design through AI

Keynote Lectures

Oral Communications

AI for image reconstruction

Keynote Lectures

Oral Communications

AI for image analysis and statistical inference

Keynote Lectures

Oral Communications

Interpretability and Explainability

Keynote Lectures

Oral Communications

AI for neuroscience and clinical applications

Keynote Lectures

Oral Communications

Current challenges and future perspectives

Keynote Lectures

Oral Communications

Introductury presentations

“Opening remarks”
Marco Geppi - University of Pisa (Italy)

“Welcome and introduction to the workshop”
Nicola Toschi – University of Rome Tor Vergata (Italy)
Abstract: In this very brief talk I will take the audience through the main motivations and spirit behind organizing this workshop, the ideas that have led to the actual structure you will find, and outline a few practical aspects and features that will male the workshop more enjoyable.

"Focused introduction to deep learning for biomedical applications"
Andrea Duggento – University of Rome Tor Vergata (Italy)
Abstract: In this focused introduction to deep learning for biomedical applications, a brief historical account about the first deep neural networks architectures. The main neural network architectures employied in biomedical applications will be discussed, together with some conclusions about the future of neural networks in medicine.

Hardware and sequence design through AI

Keynote Lectures

"Potential and potential pitfalls of AI for the diagnostic MRI pipeline“
Florian Knoll – NYU Langone Health (United States)
Abstract: Recent basic science developments in optimization and machine learning, as well as widespread access to powerful computing resources and large datasets have the potential to change the way magnetic resonance imaging is performed. I will discuss the potential to make imaging faster, cheaper, easier to use, more patient friendly and accessible, and to obtain new information. I will cover both methodological developments as well as clinical translation and validation and discuss ongoing developments as well as currently open research questions and potential pitfalls of the methodology.

"Deep Designed RF“
Jongho Lee – Seoul National University (Republic of Korea)
Abstract: In this presentation, RF pulses designed by deep reinforcement learnining will be introduced. A newly developed algorithm, DeepRF, demonstrates successful generation of various types of RF (e.g, excitation, inversion, B1-insensitive inversion ...) by self-training. The resulting RFs reveal improved SAR while pertaining slice profiles when compared to conventional SLR or adiabatic RF pulses.

Oral Communications

"Artificial Intelligence in RF Pulse Design: from High Resolution NMR to Imaging"
Gianluigi Veglia / Manu Veliparambil Subrahmanian – University of Minnesota (United States)
Abstract: High fidelity unitary control of quantum systems is central to quantum computing and several spectroscopies spanning from optics, coherent spectroscopy, NMR, MRI and EPR. Here we introduce a time-optimal RF pulse design strategy and developed a Neural Network for generating high-fidelity broadband RF pulses with customizable operation, bandwidth, RF inhomogeneity compensation and operational fidelity. Applications include traditional NMR experiments, imaging at high RF inhomogeneity, high-fidelity operations for quantum information processing. The newly designed RF pulses are more robust and less prone to imperfection than the commonly used shapes for basic liquid-state NMR experiments and reduce RF artifacts in MRI. This new strategy will enable the design of efficient quantum computing operators as well as new spectroscopic and imaging techniques.

"Optimal and DeepControl in MRI pulse sequence"
Mads Sloth Vinding – Aarhus University (Denmark)
Abstract: The DeepControl programs are deep neural networks taught to mimic conventional pulse design algorithms that generate tailored RF pulses for MRI experiments. Specifically, we have shown that 2DRF pulses, used e.g. for reduced-FOV imaging, with similar performance, can be predicted by DeepControl more than three orders of magnitude faster than our conventional optimal control algorithms can compute these. The talk will introduce the background for our research, the DeepControl concept and results. Starting from simple phantom and in vivo 2DRF experiments at 3 T, we recently demonstrated the application in vivo at 7 T for single-channel transmit 2DRF pulses facilitating field inhomogeneity compensation - to the best of our knowledge - as the first AI-powered pulse design for ultrahigh field imaging.

AI for image reconstruction

Keynote Lectures

"Known Operator Learning - An approach to unite machine learning, signal processing, and physics"

Andreas Maier – Friedrich-Alexander-Universität Erlangen-Nürnberg (Germany)

Abstract: We describe an approach for incorporating prior knowledge into machine learning algorithms. We aim at applications in physics and signal processing in which we know that certain operations must be embedded into the algorithm. Any operation that allows computation of a gradient or sub-gradient towards its inputs is suited for our framework. We derive a maximal error bound for deep nets that demonstrates that inclusion of prior knowledge results in its reduction. Furthermore, we show experimentally that known operators reduce the number of free parameters. We apply this approach to various tasks ranging from computed tomography image reconstruction over vessel segmentation to the derivation of previously unknown imaging algorithms. As such, the concept is widely applicable for many researchers in physics, imaging and signal processing. We assume that our analysis will support further investigation of known operators in other fields of physics, imaging and signal processing.

"Unsupervised deep learning for MR reconstruction using physics-informed cycleGAN"

Jong Chul Ye – Korea Advanced Institute of Science and Technology (Republic of Korea)

Abstract: Recently, deep learning approaches for accelerated MRI have been extensively studied thanks to their high performance reconstruction in spite of significantly reduced run- time complexity. These neural networks are usually trained in a supervised manner, so matched pairs of subsampled and fully sampled k-space data are required. Unfortunately, it is often difficult to acquire matched fully sampled k-space data, since the acquisition of fully sampled k-space data requires long scan time and often leads to the change of the acquisition protocol. Therefore, unpaired deep learning without matched label data has become a very important research topic. In this paper, we propose an unpaired deep learning approach using a optimal transport driven cycle-consistent generative adversarial network (OT-cycleGAN) that employs a single pair of generator and discriminator. The proposed OT-cycleGAN architecture is rigorously derived from a dual formulation of the optimal transport formulation using a specially designed penalized least squares cost. The experimental results show that our method can reconstruct high resolution MR images from accelerated k- space data from both single and multiple coil acquisition, without requiring matched reference data.

Oral Communications

”AI generated hallucinations in the sciences - On the stability accuracy trade-off in deep learning”

Vegard Antun – University of Oslo (Norway)

Abstract: Artificial intelligence (AI) is changing the world in front of our eyes, yielding the question: How reliable is modern AI, and can it be trusted? This talk will discuss how AI techniques used in medical imaging can produce highly untrustworthy outputs, yielding potential incorrect medical diagnosis. Moreover, we will show an inherent trade-off between how stable and how accurate methods can become for image reconstruction from undersampled acquisitions. This can be explained in a mathematically precise way, demonstrating fundamental limitations of modern AI approaches.

"Self-Supervised Deep Learning of MRI Reconstruction without Reference Data"

Mehmet Akcakaya – University of Minnesota (United States)

Abstract: Deep learning (DL) techniques have emerged as an alternative for accelerated MRI due to their improved reconstruction quality. State-of-the-art methods use a physics-guided approach, incorporating the multi-coil encoding operator. Such physics-guided neural networks are trained end-to-end, typically in a supervised fashion using fully-sampled/high-quality ground-truth references. However, in a number of cases, it is impossible to acquire ground-truth data, hindering the applicability of the DL methods. In this talk, we present recent advances in self-supervised learning for physics-guided DL reconstruction, when ground-truth data is not available. We show that the self-supervised DL reconstruction trained on sub-sampled data performs similar to the supervised approach trained on ground-truth data. We also show applications in absence of fully-sampled data, extending the utility of physics-guided DL reconstruction.

AI for image analysis and statistical inference

Keynote Lectures

"Deep Learning for Dynamic MRI Reconstruction"

Chen Qin - The University of Edinburgh (United Kingdom)

Abstract: Recent advances in deep learning have shown great potentials in improving the entire medical imaging pipeline, from image acquisition and reconstruction to disease diagnosis. In this talk, I will mainly focus on discussing deep learning for Magnetic Resonance (MR) image reconstruction. I will introduce our recent study on dynamic MR image reconstruction from highly undersampled k-space data, including the use of recurrent neural networks for modelling the sequential processes as well as exploiting complementary time and frequency domain knowledge for dynamic MRI reconstruction in both single-coil and multi-coil settings. We show that deep learning is effective for dynamic MR image reconstruction in terms of both reconstruction quality and speed.

"Artificial Intelligence in MRI: from raw data to analysis"

Daniel Remondini / Gastone Castellani – Bologna University (Italy)

Abstract: AI can provide novel opportunities within MRI along all the path from data generation to final analysis.
In this talk we will show some recent applications that our group is performing in different steps of this path:
Deep Learning methods to circumvent the curse of dimensionality in MR fingerprinting
MR image enhancement through DL super-resolution
Age prediction through brain MRI

Oral Communications

"Self-Supervised Natural Image Reconstruction and Rich Semantic Classification from Brain Activity"

Guy Gaziv - Weizmann Institute of Science (Israel)

Abstract: Reconstructing seen natural images and decoding their novel semantic category from a subject's evoked fMRI response is a milestone for developing brain-machine interfaces and for the study of consciousness. Unfortunately, acquiring sufficient (Image,fMRI) "paired" training data to span the huge space of natural images and their semantic classes is prohibitive, resulting in limited generalization power of today's decoders. We present a novel self-supervised approach that overcomes the inherent lack of training data, simultaneously for both tasks -- image reconstruction and large-scale semantic classification. Specifically, we impose cycle-consistency using two networks, encoder (E) & decoder (D), and train on additional "unpaired" data from the image and the fMRI domains. Concatenating those two networks back-to-back, E-D, allows for unsupervised training on unpaired images (i.e., images without fMRI recordings) -- 50,000 natural images from 1000 ImageNet semantic categories in our experiments. Such self-supervision adapts the network to the statistics of novel images and their diverse categories. Similarly, concatenating our two networks, D-E, allows for unsupervised training on additional unpaired fMRI samples (i.e., fMRI recordings without images). Moreover, combining high-level perceptual reconstruction criteria with self-supervision on unpaired images results in a leap improvement over top existing methods, achieving unprecedented image-reconstruction from fMRI of never-before-seen images (evaluated by image metrics and human testing), and large-scale semantic classification (1000 diverse classes) of categories that are never-before-seen during network training (exceeding chance level accuracy by more than 100-fold). We further visualize the receptive field underlying our decoder and show the emergence of classic retinotopic organization. These results support the biological plausibility of our model.

"Machine Learning Applications to Microstructure Imaging through Diffusion MRI"

Marco Palombo – University College London (United Kingdom)

Abstract: This talk will provide an introduction to microstructure imaging through dMRI and an overview of how machine learning can help improving several important aspects of it.
Diffusion MRI (dMRI) signal is sensitive to the tissue architecture at the cellular scale, namely microstructure. By analysing the dMRI measurements acquired with different experimental parameters, it is possible to infer some of the tissue properties (e.g. cell density, size and shape), with the ultimate goal of providing quantitative maps of tissue features and potentially define more specific biomarkers of the tissue state.

"A Deep Graph Neural Network Architecture for rs-fMRI Data"

Tiago Azevedo – University of Cambridge (United Kingdom)

Abstract: Resting-state functional magnetic resonance imaging (rs-fMRI) has been successfully employed to understand the organisation of the human brain. For rs-fMRI analysis, the brain is typically parcellated into regions of interest (ROIs) and modelled as a graph where each ROI is a node and pairwise correlation between ROI blood-oxygen-level-dependent (BOLD) time series are edges. Recently, graph neural networks (GNNs) have seen a surge in popularity due to their successes in modelling unstructured relational data. The latest developments with GNNs, however, have not yet been fully exploited for the analysis of rs-fMRI data, particularly with regards to its spatio-temporal dynamics. Herein we present a novel deep neural network architecture, combining both GNNs and temporal convolutional networks (TCNs), which is able to learn from the spatial and temporal components of rs-fMRI data in an end-to-end fashion. In particular, this corresponds to intra-feature learning (i.e., learning temporal dynamics with TCNs) as well as inter-feature learning (i.e., leveraging spatial interactions between ROIs with GNNs). We evaluate our model with an ablation study using 35,159 samples from the UK Biobank rs-fMRI database. We also demonstrate explainability features of our architecture which map to realistic neurobiological insights. We hope this model could lay the groundwork for future deep learning architectures focused on leveraging the inherently and inextricably spatio-temporal nature of rs-fMRI data.

"Robust estimation of cerebral oxygen metabolism with machine learning"

Mike Germuska – Cardiff University (United Kingdom),

Abstract: Artificial neural networks are known to be robust estimators in the presence of noise. In this talk I show the potential for machine learning in physiological MRI for mapping cerebral oxygen metabolism. The performance of ML is compared to alternative statistical methods and the practicalities of applying ML to time series data is discussed.

"Brain MRI segmentation and reconstruction. A Deep Learning perspective"

Giovanna Maria Dimitri – Università degli Studi di Siena (Italy)

Abstract: In this talk I will briefly sketch applications of Deep Learning techniques to Brain MRI segmentation and reconstruction. The talk will cover some introductory aspects of Deep Learning models for segmentation, with a focus on Convolutional Neural Networks.

"Overcoming the challenges of data paucity in deep learning for neuroimaging"

Simeon Spasov – University of Cambridge (United Kingdom)-

Abstract: Medical imaging datasets usually comprise multi-modal data with high dimensionality and complexity from relatively few subjects. In this talk, I address the challenges of applying deep learning models to such data formats, specifically 1) limiting overfitting and improving performance; 2) improving computational efficiency and model optimization. I propose the use of 3D separable convolutions which decompose the conventional convolution in two steps, hence reducing the number of parameters needed for implementation. I demonstrate that such parameter-efficient model architectures achieve state-of-the-art performance on classification and image reconstruction tasks. In conclusion, I also discuss transfer learning as a promising future research direction which can allow for increasing the availability of training data, as well as reducing the need for potentially expensive or dangerous data collection procedures.

Interpretability and Explainability

Keynote Lectures

"Explainable and Robust Deep Learning for Medical Domain"

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

Abstract: The role of AI in healthcare is becoming more and more important as we venture into advanced algorithms to detect, diagnose, and generate treatment plans for a variety of diseases. However, the best use of AI algorithms today in healthcare are to be decision aids to human decision makers rather than having the AI algorithms make the final decisions. In this presentation I cover: 1) Robust Representation Learning and Uncertainty. How do we build models that have the power of deep learning that work well in I.I.D. settings but can also generalize and avoid surprises when making decisions in an uncertain world of O.O.D. plus to know what it doesn't know.

Oral Communications

"Explaining Explanation Methods: from LIME to DoctorXAI"

Riccardo Guidotti – University of Pisa (Italy)

Abstract: *The presentation reviews state of the art in eXplainable Artificial Intelligence (XAI). First, basic notions and motivations are introduced. Then the recognized taxonomy and categorization of XAI terms are presented. Finally, we discuss in detail the most widely adopted explainers and the returned explanations, and we discuss how they can be read and exploited in the medical domain.*

"Quo vadis Europe? A comparative outlook at proposed explainability regulation"

David Schneeberger – University of Vienna (Austria)

Abstract: This talk describes the current and the (possible) future regulatory framework of explainability. After an overview on the GDPR "right to explanation", product safety law and informed consent, it then describes why ethical guidelines are not sufficient. It then moves on to a comparative discussion about new proposals on AI regulation at the European. The EU and the Council of Europe have proposed broad horizontal regulations (affecting every sector) based on basic principles like non-discrimination and transparency, explainability and accountability. A comparative analysis shows that these proposals both contain similar core elements: a duty to inform about the use of AI, about the capabilities and limits of an AI system and the duty to make AI explainable. Importantly it has been recognized that there are technical limits to explainability and that explainability must be balanced against other interests. Besides explainability, documentation and audits/impact assessments will be core elements. The talk concludes with open questions and an outlook on upcoming policy developments.

AI for neuroscience and clinical applications

Keynote Lectures

"Impact of AI and deep learning on imaging of neurodegenerative diseases"

Duygu Tosun-Turgut – San Francisco Veterans Affairs Medical Center (United States)

Abstract: Biomarkers have become increasingly important to understand the biology of neurodegenerative diseases. We now see a paradigm shift recasting the definition of neurodegenerative disease in living people from syndromal to a biological construct. Effective implementation of such biological constructs though requires widespread availability of biomarkers. This talk will address some of the challenges and AI based advances in neuroimaging-based biomarkers for faster, safer, and smarter operationalization of biomarker-based classification, risk assessment, diagnosis, prognosis, and even prediction of therapy responses in neurodegenerative diseases.

"Artificial Intelligence in Cancer Imaging"

Hugo Aerts – Harvard Medical School, Boston (United States)

Abstract: Medical imaging in oncology has traditionally been restricted to the diagnosis and staging of cancer. But technological advances in Artificial Intelligence (AI) are moving imaging modalities into the heart of patient care. Imaging can address a critical barrier in precision medicine as solid tumors can be spatial and temporal heterogeneous, and the standard approach to tumor sampling, often invasive needle biopsy, is unable to fully capture the spatial state of the tumor. Radiomics refers to the automatic quantification of this radiographic phenotype. Radiomic methods heavily rely on AI technologies, in specific engineered and deep-learning algorithms, to quantify phenotypic characteristics that can be used to develop non-invasive biomarkers. In this talk, Dr. Aerts will discuss recent developments from his group and collaborators performing research at the intersection of radiology, bioinformatics, and data science. Also, he will discuss recent work of building a computational image analysis system to extract a rich radiomics set and use these features to build radiomic signatures. The presentation will conclude with a discussion of future work on building integrative systems incorporating both molecular and phenotypic data to improve cancer therapies.

"Artificial intelligence for early diagnosis and clinical decision making in neurodegenerative disorders"

Federica Agosta – Vita-Salute San Raffaele University (Italy)

Abstract: Magnetic resonance imaging (MRI) is playing an increasingly important role in the study of neurodegenerative diseases, delineating the structural and functional alterations determined by these conditions. Advanced MRI techniques are of special interest for their potential to characterize the signature of each neurodegenerative condition and aid both the diagnostic process and the monitoring of disease progression. This aspect will become crucial when disease-modifying (personalized) therapies will be established. In the past decade, artificial intelligence has been applied enthusiastically in the field of medicine, outperforming other established methods. In the field of neurodegenerative diseases and biomarkers, artificial intelligence algorithms applied to MRI have proven their worth in many ways including aiding the image-based prediction of different neurological diseases, the anatomical segmentation of specific brain structures, and the discovery and development of new therapies.

"AI for psychiatric imaging: promises and challenges"

Hugo G. Schnack – UMC Utrecht (Netherlands)

Abstract: To date, many examples of machine learning models that successfully discriminate between patients with psychiatric disorders and healthy individuals based on neuroimaging data have been published. However, diagnostic accuracy and generalisability are not yet good good enough for clinical application. The limitations of the current learning designs are discussed with a focus on the weak relationship between input and output. A number of approaches that may lead to prediction models that have improved performance and clinical relevance are discussed, including prognostic (as opposed to diagnostic) and normative modeling.

"Machine Learning on MRI of Breast Cancer"

Maryellen L. Giger – The University of Chicago (United States)

Abstract: Artificial Intelligence in medical imaging involves research in task-based discovery, predictive modeling, and robust clinical translation. Quantitative radiomic analyses, an extension of computer-aided detection (CADe) and computer-aided diagnosis (CADx) methods, are yielding novel image-based tumor characteristics, i.e., signatures that may ultimately contribute to the design of patient-specific cancer diagnostics and treatments. Beyond human-engineered features, deep convolutional neural networks (CNN) are being investigated in the diagnosis of disease on radiography, ultrasound, and MRI. The method of extracting characteristic radiomic features of a lesion and/or background can be referred to as "virtual biopsies". Various AI methods are evolving as aids to radiologists as a second reader or a concurrent reader, or as a primary autonomous reader. This presentation will discuss the development, validation, and ultimate future implementation of AI in the clinical radiology workflow including the example of breast cancer.

Oral Communications

"Dissecting the progression of multiple sclerosis through explainable ML techniques"

Allegra Conti – University of Rome Tor Vergata (Italy)

Abstract: In multiple sclerosis, cortical lesions are a main determinant of disease progression. Recently, it has been suggested that the presence of chronic active white matter lesions harboring a paramagnetic rim is associated with a more aggressive form of the disease. However, it is still uncertain how these two types of lesions are related, or which one plays a larger role in disability advancement. Using 7 T MRI, we characterized cortical and rim lesions prevalence, interplay and evolution. Also, using state of the art machine learning algorithms (extreme gradient boosting), we assessed their cumulative power as well as individual importance in predicting disease stage and disability progression. Our results show that volumes of both rim and cortical lesions increase over time. By using an XGBoost classifier, it has been found that the evaluation of rim and cortical lesions volumes in MS might result in an improved ability to distinguish the patients susceptible to experience a progression of the neurological disability and also supports the clinical decision.

"A Machine Learning Framework for Assessing the Effect of Prematurity on MRI Metrics of Functional Connectivity and Regional Brain Structure"

Antonio Maria Chiarelli – G. D'Annunzio University (Italy)

Abstract: Premature birth induces modifications in the developmental trajectory of the brain during a period of intense maturation with possible lifelong consequences.
We performed anatomical and functional MRI at term-corrected age on 88 newborns with varying gestational age (GA) at birth. We obtained measures of resting-state functional connectivity, functional connectivity density, local functional activity and regional tissue volume in a set of 90 cortical and subcortical brain regions. A data-driven multivariate analysis framework (i.e. Machine Learning framework) was built to exploit the high dimensionality of the data in assessing the sensitivity of each metric to the effect of premature birth. The results showed that prematurity was associated with bidirectional alterations of functional connectivity and regional volume, and, to a lesser extent, with modification of regional activity. Notably, the effects of prematurity on functional connectivity were spatially diffuse, whereas effects on regional volume and activity were more localized to specific regions, such as subcortical structures. Machie Learning methods appear well suited to identifying premature infants at risk of negative neurodevelopmental outcome based on MR neuroimaging.

"Improving Advanced Imaging Workflows with AI"

Patrick Bolan – University of Minnesota (United States)

Abstract: This talk addresses the potential for using artificial intelligence methods for improving workflow for advanced MRI methods. These workflows benefit from fast computation and object segmentation inherent in many AI techniques. Applications in magnetic resonance spectroscopy and multi-channel RF transmit systems are presented, and potential areas for further exploration are discussed.

"Clinical Applications of AI in Diagnostic Imaging"

Tommaso Banzato – University of Padova (Italy)

Abstract: This presentation focuses on the Clinical Applications of AI in Diagnostic Imaging. The main field of application are explored. Namely, the possibility to integrate AI-based systems for optimal patient scheduling, image quality improvement, automated detection of imaging findings, and for the analysis of free text reports. Some use cases are provided.

"Predictive models from metabolomic data"

Claudio Luchinat – University of Florence (Italy)

Abstract: Metabolomics by NMR is ideally suited for untargeted research and unsupervised analysis. I will show by way of examples various statistical methods used to get the most from NMR data, including some developed by us, as well as an example of a machine learning approach to predict the chemical shifts of metabolites in urine samples, allowing for automated assignment of urine spectra.

Current challenges and future perspectives

Keynote Lectures

"Unstructured data, ML and AI for healthcare and industry 4.0 applications"

Donatello Apollusion Gassi – Amazon Web Services (AWS), **Giuseppe Leonardo Cascella –** Idea75

Abstract: In this keynote, the state of the art of AWS' tools for AI and ML application in healthcare will be considered. Thanks to their flexibility and scalability, Idea75 will also show how the same tools can be successfully applied in IoT and industry4.0 solutions. Real-world use cases of unstructured data, information extraction, custom models, and deep learning will be discussed.

"Interpretability and Explainability in Machine Learning: lesson learnt, challenges and directions from a NLP perspective"

Roberto Basili – University of Rome Tor Vergata (Italy)

Abstract: AI provides successul techniques in the area of learning and language processing, that can be profitably applied to a larger set of domains. However, the cognitive focus of AI research is still the driving force of its development. Current AI challenges are increasingly related to aspects such as governance and explainability of AI models and processes. In this talk I discuss explainability methods as they are proposed in the area of NLP, with a specific focus on the adoption of kernel methods integrated with deep learning. The role and impact of explanation in different NLP tasks is discussed as a further example.

"Current challenges and future perspectives of machine learning techniques in medical imaging"

Stefano Diciotti – Bologna University (Italy)

Abstract: The application of machine learning techniques is rapidly emerging in Neuroimaging. In this presentation, I will show some important challenges related both to data and algorithms. The quality control and the employment of large (high-quality) datasets are fundamental aspects for training effective machine learning models. Efforts should also be put in the improvement of transparent reporting and reproducibility related to data, code and papers. These are the main requirements for producing high quality machine learning research in the Neuroimaging field. Finally, I will give you a short mention of explainable AI methods that emphasize the development of more interpretable, explainable models – the ultimate goal of big data in Neuroimaging.

Oral Communications

"Clinician-in-the-loop AI: for a fairer model of clinical knowledge exploitation"

Fabio Massimo Zanzotto – University of Rome Tor Vergata (Italy)

Abstract: Artificial Intelligence is replacing clinicians in some tasks: are you ok with this?

"AI for MRI: An industrial perspective and outlook"

Marcello Cadioli - Philips Healthcare (Italy)

Abstract:AI based methods are feeding all the innovations Philips is bringing to the market as clinical and technical solutions. I wish to share the perspective of using AI for active real time monitoring of MR systems status and for helping technologists and radiologists in their daily routines and workflows

"AI for healthcare"

Birgi Tamersoy – Siemens Healthcare (Italy)

Abstract: Artificial Intelligence in Healthcare from a Data Continuum Perspective