Newsletter

Summer 2024

ProCAncer-I

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European Commission

Grounded in Evidence: building trust through Clinical Validation

Editorial by Manuel Marfil (on behalf of GIBI230: Research Group on Biomedical Imaging of Instituto de Investigación Sanitaria La Fe, HULAFE

After more than three years of the ProCAncer-I project, we have come a long and fascinating way that now faces a challenging yet crucial task: the fnal evaluation of the models before their deployment. We have witnessed so far the creation of the cloud infrastructure that enabled the collection of the largest European database of prostate cancer data, the development of AI-based diagnostic support models as well as their internal validation with a subset of prospective data. It is now time to evaluate their performance by simulating a realistic environment using the FUTURE-AI guidelines as a fundamental pillar: a technical and a clinical validation.

The technical validation will consist of monitoring the generalization ability of the models throughout the remaining project duration with unseen data, focusing on the principles of Fairness (F), Traceability (T), and Robustness (R). This ensures models do not discriminate against subsets of the population, that their development and methodology are well-documented for reproducibility and scientific validity, and that they are reliable over time and under various conditions, respectively. This process will allow retraining the models with all repository data once monitoring is complete and correcting factors that may reduce performance, culminating in the final models ready for deployment.

Simultaneously, the clinical validation of the generated AI models will be developed before their deployment. The AI developed in this project aims to integrate into daily clinical practice as a disruptive tool that initially generates a mix of fascination and doubt but eventually becomes indispensable, much like other medical marvels such as blood tests analysis, human genome sequencing or multiparametric magnetic resonance images (mpMRI). Therefore, clinical validation will provide the closest estimation of the interaction between the clinician and the tool.

Analyzing this interaction is critical because, personally, I believe a tool, no matter how good it is considered, is useless if no one is willing to use it. This is precisely the challenge we face, well indicated by the other three principles of the FUTURE-AI guidelines:

Universality (U), Usability (U), and Explainability (E). These ensure that these tools are accessible and applicable internationally regardless of hospital protocols andmethodologies. They also ensure that the tool is as intuitive as possible for clinicians to interact with, and that integration into their work environment is easy to deploy. Last but not least, for these models to be useful and in demand, both the clinician and the patient should trust them. Trust comes from understanding, which is why a fundamental pillar worked on by the model developers is the ability to provide clear explanations of their decisions.

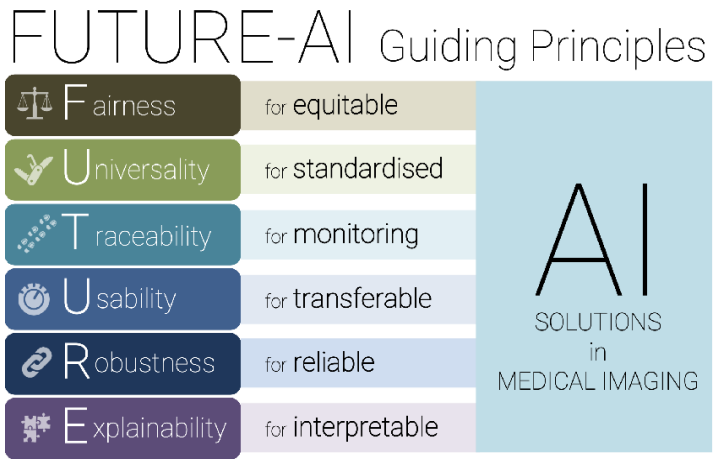
The clinical validation framework will be separated by use cases, mainly classified into classification, detection and segmentation models. The primary goal has been to create a harmonized methodology for all of them, while accommodating certain differences due to their purposes. Regarding the shared aspects, for each use case, approximately two dozen clinicians will evaluate the most mature models. To control the variable of clinical experience, these clinicians will be divided into groups based on their years of experience reporting prostate cases with mpMRI and the estimated number of case reads per year.

Additionally, since multiple clinicians and models exist for each use case, it is necessary to analyze inter-clinician and inter-model variability. Thus, a subset of the cases will be validated by several clinicians and the outputs of different models will be compared to assess how these two variables affect the intrinsic variability of data from numerous European centers. This variability is due not only to patient differences based on geographic location but also to different mpMRI providers and models, as well as differences in acquisition methodologies.

Firstly, focusing on the classification and detection models, the methodology focuses on comparing traditional diagnosis with human-AI symbiosis. Two sessions will be conducted where the clinician analyzes the same cases to compare performance and subjective perception in terms of diagnostic time for each patient, confidence in the diagnosis and diagnostic accuracy through metrics like sensitivity and specificity. The histopathological information will serve as the gold standard for determining if the clinician was correct. On the opposite side of the outputs, inputs for diagnosis will include a combination of mpMRI (T2W, DWI & ADC) sequences along with clinical data, excluding data that could allow clinicians to "cheat" such as biopsy results from a patientwhere goal is to use mainly medical images to detect lesion prior to any invasive intervention.

Lastly, for segmentation models, the goal differs from the previous: not to compare a clinician with and without AI, but to evaluate the ability to generate accurate masks of the prostate organ compared to manual segmentation by clinicians from the T2W MRI sequence. The objective is to assess how the segmentation masks of the region of interest under-segment, over-segment, and overlap with the gold standard, in other words, the manual masks.

In conclusion, the next step of this project is increasing the hype not only among consortium participants but also among participating clinicians who recognize the potential these models could have in their daily practice. Beyond any other purpose of the project, however, is the patient who is suffering from the physical and psychological effects of cancer, to whom these new technologies would not only improve their quality of life but also increase the chances of overcoming the disease with fewer side effects.



Artificial Intelligence-Powered Prediction of Prostate Cancer Treatment Response After Radiation Therapy

By Jurgita Usinskiene (Dr. chief radiologist), Kristina Slidevska (radiation oncologist), Audrius Untanas (radiologist); National Cancer Institute, Vilnius, Lithuania

Prostate cancer remains a significant health challenge, with treatment strategies continuously evolving to improve patient outcomes. However, there is no precise tool to predict responses to treatment based on diagnostic imaging radiomic features.

Radiation Therapy for Prostate Cancer

Radiation therapy, a non-interventional treatment, can be utilized in several scenarios:

• As the first treatment for cancer confined to the prostate gland, especially for lower-risk cases. Cure rates for these cancers are comparable to those treated with radical prostatectomy.

• In combination with hormone therapy for higher-risk cancers that are still localized within the prostate or have spread to nearby tissues.

• If surgery is incomplete or if the cancer recurs in the prostate area post-surgery.

The primary types of radiation therapy for prostate cancer are external beam radiation (EBRT) and brachytherapy (internal radiation).

External Beam Radiation Therapy (EBRT) EBRT involves focusing radiation beams on the prostate gland from an external machine. The most common form, Intensity-Modulated Radiation Therapy (IMRT), uses a computer-driven machine that moves around the patient, delivering radiation from multiple angles. IMRT allows adjustment of beam intensity to limit radiation exposure to nearby normal tissues, enabling higher doses to the cancerous area. IMRT is often combined with Image-Guided Radiation Therapy (IGRT), where imaging tests guide precise radiation delivery, potentially reducing side effects.

A variant of IMRT, Volumetric Modulated Arc Therapy (VMAT), delivers more tightly focused treatments in significantly shorter times. At our facility, all prostate cancer patients undergoing radiation therapy receive VMAT.

The Promise of AI in Prostate Cancer Management

Traditional assessment methods for prostate cancer treatment response rely on clinical evaluation, imaging, and biopsies. These can be invasive, time-consuming, and sometimes fail to provide a comprehensive picture of the tumor's response to therapy. Artificial intelligence (AI) offers a transformative approach, leveraging advanced algorithms and extensive datasets to analyze complex imaging data from multiparametric MRI (mpMRI) scans.

ProCAncer-I is an innovative project harnessing AI to predict treatment responses using an international data platform comprising prostate cancer mpMRI, PSA levels, and other clinical variables. This approach has the potential to refine therapeutic strategies early and enhance patient care.

How It Works

The process involves collecting imaging and clinical data into a cloud-based platform. High-quality mpMRI images of prostate cancer patients before and after radiation therapy are input into AI models trained to detect subtle changes in the tumor and surrounding tissues. The AI model, learning from international data that includes patients with and without biochemical relapse post-radiation therapy, analyzes parameters such as tumor size, shape, texture, and molecular characteristics to predict treatment response. The AI model's output indicates either disease-free status or relapse.

Benefits of Early Intervention

A significant advantage of AI-driven treatment response prediction is the ability to intervene early. If the AI model suggests a poor response to radiation therapy, clinicians can promptly adjust the treatment plan. This may involve switching therapies, increasing radiation doses, or integrating additional treatments like hormone therapy. Early intervention can lead to better outcomes and reduce cancer recurrence risk.

Enhancing Patient Comfort and Resource Allocation

AI predictions can reduce the need for invasive procedures, improving patient comfort and experience. Additionally, healthcare resources can be allocated more efficiently, ensuring appropriate treatments without unnecessary delays or expenses.

The Future of Prostate Cancer Treatment

As AI technology advances, its applications in prostate cancer treatment are expected to grow. This project represents a significant step towards more personalized, precise, and effective cancer care. Integrating AI into clinical practice can lead to treatment decisions guided by data-driven insights, resulting in better patient outcomes and more efficient use of medical resources.

Case Studies

Case No. 1

•Patient Details: Elevated PSA (6.49 ng/mL), Gleason score 4+3=7, DRE - T3b.

•Diagnosis: mpMRI revealed a PI-RADS 5 lesion on the left side (Fig.A)

•Treatment: Radiotherapy combined with hormone therapy in 09-2021.

•Outcome: Follow-up mpMRI in 05/2023 showed no local recurrence. (Fig.B)

Case No. 2

•Patient Details: Elevated PSA (5.8 ng/mL), Gleason score 3+4=7, DRE - T2.

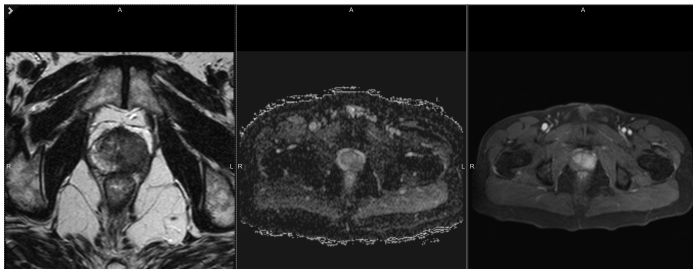
•Diagnosis: mpMRI revealed a PI-RADS 4 lesion on the left side. (Fig.C)

•Treatment: High-Dose Rate (HDR) brachytherapy in 05/2020.

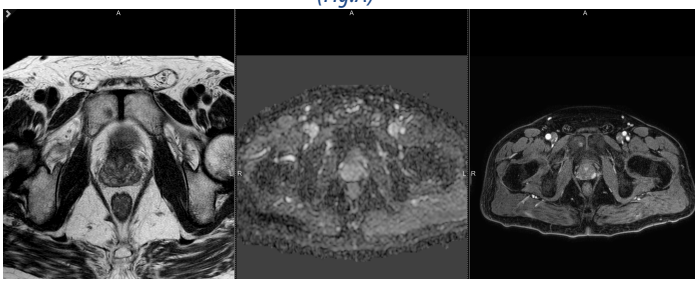
•Outcome: Follow-up mpMRI in 02/2024 diagnosed disease relapse. (Fig.D)

Conclusion

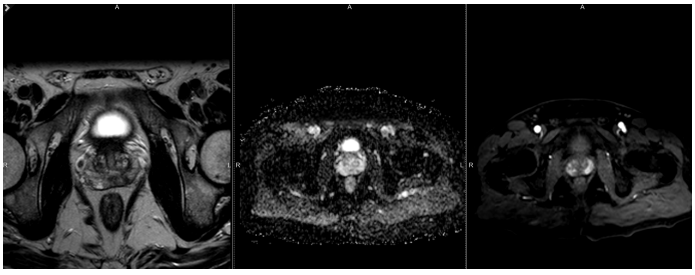
The integration of AI in predicting prostate cancer treatment responses following radiation therapy holds immense promise. By enabling early evaluation of treatment efficacy and allowing timely adjustments in therapeutic strategies, this project aims to enhance patient care, reduce discomfort, and optimize the use of medical resources.



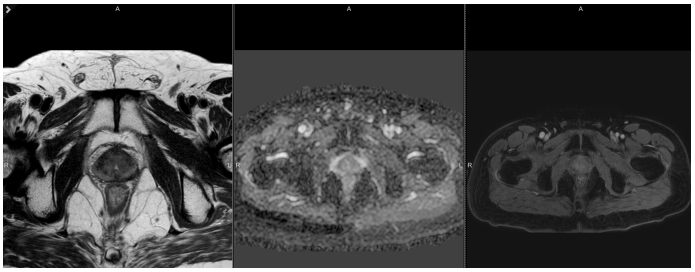
(Fig.A)



(Fig.B)



(Fig.C)



(Fig.D)

Presentation of the AI-QUAL study

By Prof. Daniele Regge, Chief of the Radiology Unit and Simone Mazzetti; Candiolo Cancer Institute, Torino-Italy

Magnetic resonance imaging (MRI) has become an essential tool in the diagnosis and management of patients with localised prostate cancer (PCa). Present-day urology guidelines advise the use of MRI, as it can precisely and non invasively identify clinically significant prostate cancers that need treatment. This evidence has produced a rapid evolution and demand of prostate MRI worldwide, inevitably leading to variability in vendor and scan quality among imaging centres, with consequent risk of generating suboptimal diagnostic examinations. Adequate image quality is a prerequisite for the detection of prostate cancer, to guarantee an accurate visualization of the prostate gland and its surrounding structures, and it is related to both MRI technical parameters and to the patient's preparation and habitus.

Efforts have been made to standardize image acquisition and interpretation via the development of internationally recognised scoring systems, such as the PI-RADS and PI-QUAL. However, both systems partially depend on the subjective experience and acumen of humans, which is related to readers experience and training.

Beside human interpretation and reporting of prostate MRI examinations, artificial intelligence (AI) is an evolving technology that is rapidly transforming the landscape of healthcare. AI's role is not merely about automating processes; it fundamentally changes the approach to disease diagnosis, making it more precise and efficient, accelerating the analysis of medical images and reducing human interpretation errors. By learning from large datasets, AI algorithms can identify patterns and anomalies that might be overlooked by the human eye, which is crucial for diagnosing complex diseases such as cancer. However, the integration of AI in clinical settings is not without challenges. One concern is about training and validation of AI algorithms, based on adequate datasets satisfying the quality requirements set by the guidelines.

The AI-QUAL study we have designed within the ProCAncer-I project aims to develop an AI tool which could assist medical scientists with the selection of high-quality prostate MRI examinations through various steps. First, it will test if the MRI studies were acquired according to the minimum set of scanning parameters (e.g., slice thickness, and pixel resolution). Second, it will identify the most relevant artefacts or other issues that may be present in the images (e.g., patient movements, blurring, geometric distortions). These quality checks will ensure that MRI acquisitions are of sufficient quality for accurate AI development.

The AI-QUAL study was designed thanks to the collaboration between FPO, who provided the clinical expertise, Radboudumc who made available the platform and the interface to assess image quality, and FORTH who retrieved the dataset from the ProstateNET, balancing the cases according to MRI vendors and magnetic field strengths. Moreover, the AI-QUAL study will involve several other partners of the ProCAncer-I Consortium, including the 13 radiologists from 10 different Institutes who will assess the quality of about 1,000 prostate MRIs, setting the reference standard of the study by identifying possible artefacts or other aspects that could be detrimental for image interpretation. Then, the technical partners of the Consortium will implement the AI algorithms for the automatic identification of poor quality MRI examinations.

The results of the AI-QUAL study will allow to quickly evaluate MRI scans for adequacy for AI applications, without relying on personal opinions, allowing the creation of datasets compliant with the most recent urology guidelines, also increasing reliability of the algorithms that will be implemented and validated on such high quality MRI datasets.

How the clinicians see that the models that have been developed and validated, could affect and modify current patient management

Interview with Dr. Kai Vilanova, Director MRI Clínica Girona, Coordinator Radiology, Faculty of Medicine, University of Girona. Director School of MRI-ESMRMB (IDIBGI)
Prof. Dow-Mu Koh, MD., M.R.C.P., F.R.C.R. Professor in Functional Cancer Imaging, Consultant Radiologist in Functional Imaging Royal Marsden Hospital, Sutton, UK

How do clinicians anticipate AI models will transform the diagnostic process for prostate cancer?

Dr. Kai Vilanova AI models are revolutionizing the diagnostic process for prostate cancer, especially through the use of MR. AI can quickly and accurately identify potential lesions and suspicious areas in MRI images, reducing the time radiologists need to spend on each scan. AI can integrate data from different MRI sequences (such as T2-weighted images, diffusion-weighted imaging, and dynamic contrast-enhanced imaging) to provide a more comprehensive assessment of prostate cancer. This integration allows AI to assess both the structural and functional characteristics of the prostate, leading to more nuanced diagnostic insights. Moreover, these models can detect subtle differences and patterns that may not be visible to the human eye, improving early detection of prostate cancer.

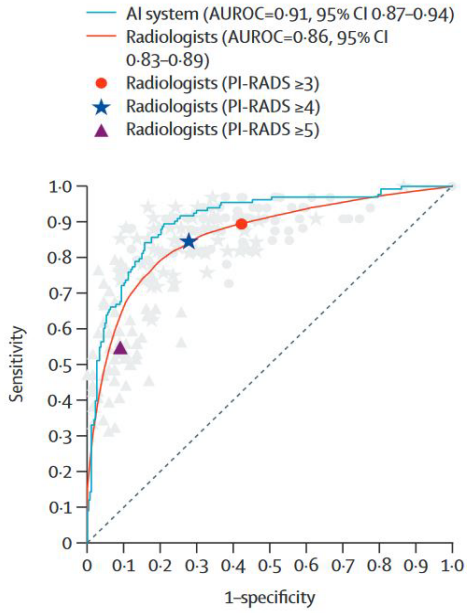
Prof. Dow-Mu Koh: Emergent studies have shown that AI models can perform as well as human radiologists for the detection of significant prostate cancer on MRI studies. Thus, AI models could be used as decision support tools towards the early and better detection of prostate cancer on MRI. There is also significant interest and development in using AI tools to define regions of interests on MRI prostate studies to guide targeted prostate biopsy for the confirming significant prostate cancer. In the future, AI models may also be used in combination with prostate MRI for screening men at risk of developing prostate cancer.

How could AI models improve patient care, treatment outcomes, and the patient experience in prostate cancer management?

Dr. Kai Vilanova The AI will provide detailed diagnostic information which can differentiate between benign and malignant areas with high precision, reducing false positives and negatives. By analyzing MRI features, AI can predict the grade of the tumor, which helps in determining the most appropriate treatment plan. These models can incorporate patient data along with MRI findings to provide a personalized risk profile, aiding in

more tailored patient management. AI models allow to perform standardizing readings, minimizing inter- and intra-observer variability among radiologists

Prof. Dow-Mu Koh: AI models developed using imaging, clinical, laboratory and relevant genomics data could in the future help to direct personalised patient care. Likewise, powerful predictive models could emerge from the use of sophisticated AI models to identify patients who might be prone to local disease recurrence following surgery or the development of metastatic disease. There is also huge potential for AI to improve the patient experience in prostate cancer management by accelerating the diagnostic workflow, thereby reducing waiting time, improving patient throughput; as well as creating new patient-centric communication of results, education and support.



How could the use of AI models impact the workload and efficiency of radiologists and other healthcare providers?

Dr. Kai Vilanova AI models will significantly reduce the workload of radiologists by automating time-consuming tasks such as image analysis and reporting, reducing the clinicians' burden. It will allow radiologists to focus on more complex cases and direct patient care, potentially leading to higher productivity and a better use of clinical expertise. It has been recently published the results of how AI can provide better results than expert radiologists, Figure (Saha A, et al. Artificial intelligence and radiologists in prostate cancer detection on MRI (PI-CAI): an international, paired, non-inferiority, confirmatory study. The Lancet Oncology. 2024 Jun). In the end, this leads to better patient outcomes and more efficient healthcare delivery.

Prof. Dow-Mu Koh: In the current situation where there is rising workload and global radiological workforce shortage, the use of AI models for automated image analysis is seen as a way of helping radiologists identify potential abnormalities on scan, which can reduce image reading times and/ or improved diagnostic accuracy. Using AI models can also help to automate and streamline the radiological workflow, by providing automatic segmentation and measurements (e.g. of prostate and disease volumes), as well as the ability to track treatment-related changes across studies. For other healthcare providers, AI models that integrate relevant clinical data can enhance treatment decision support and provide novel prognostic information that leads to more personalised treatment and optimised use of healthcare resources.

Presentation of partners

The Institut Paoli-Calmettes (IPC) Cancer Center

Based in Marseille, The Institut Paoli-Calmettes (IPC) Cancer Center has been certified Comprehensive Cancer Center by OECI (Organisation of European Cancer Institutes) in June 2019 and then in June 2024. The IPC is the first comprehensive cancer centre in the region providing cancer care. It is also a member of the national federation of Unicancer. The Institute has been licensed by the HAS (the French health authority) at the highest level in 2015.

The Centre gathers over 2,000 employees - researchers, medical doctors, health and administrative staff – engaged in wide range of activities on site: prevention, research, treatment and training. IPC registered over 100,000 consultations and over 14,000 new patients in 2023.

The Clinical Research and Innovation Direction (DRCI) has several units, including the Sponsor Unit, which coordinates the preparation, implementation and monitoring of clinical studies in oncology and onco-haematology for which the IPC is sponsor. The clinical studies sponsored by the IPC include clinical trials on medicinal products for human use (in partnership with industry), cell therapy studies, medical device studies and non-health product studies (translational research, observational studies, etc.).

As part of the ProCAncer-I project, the IPC is the only centre in France taking part in this European-funded project. The IPC has now included 444 patients out of the 450 expected, including retrospective prospective data of prostate cancer patients.

Agios Savvas (St Savvas)

The Hellenic Cancer Institute (HCI) was founded in 1935 by the "Christian Social Union". One of the first works of HCI was the establishment and operation of the "Agios Savvas" hospital (Geniko Antikarkiniko Ogkologiko Nosokomeio Athinon o Agios Savvas (GAONA St Savvas). The establishment and operation of this hospital was the realization of an old dream of the inspirational Professor and Academician Aristotle Kouzis. During the 1980s and thereafter, an important project was carried out to modernize the hospital and its facilities. The hospital is working now underthe supervision of the Ministry of Finance and is included in the "National Health System" NHS. Since 1987 a number of new medical departments and units were organized and operated, to expand the scope of medical services provided, ensuring the hospital's self-sufficiency, and harmonization with the modern requirements of medical developments, including the CT department, the Ultrasound Unit. With the creation of the CT Department and the Ultrasound Unit, the Foundation made available to its patients the full range of diagnostic imaging methods in use. From 2011 by the fusion of "Agios Savvas" Hospital with the "Georgios Gennimatas" Oncology Hospital of Social Security Institution, the Department of Advanced Imaging Modalities was established including MRI as well as PET-CT.

Since May 2020, a new 3 Tesla machine and in the same time a new PET-CT machine are in function, offering to the General Anti-Cancer and Oncological Hospital of Athens (GAONA) "St. Savvas" the opportunity to provide most modern and appropriate Diagnosis and Imaging Guided Treatment to Oncological patients, as a tertiary center covering whole Greece. Since October 2020, we are participating in the ProCAncer-I Project by offering and uploading the MRI and pathological data from 200 cases, in order to evolve an AI algorithm for patients with suspicion of prostate cancer.

"AI Liability in Health" - A Moot Court organised by UNIVIE

By Clara Saillant, Theresa Henne & Lorraine Maisnier-Boché

On 22nd May 2024, UNIVIE went back to the Computer, Privacy and Data Protection (CPDP) Conference in Brussels for a new moot court edition. Last year at the CPDP, UNIVIE organised a moot court on the topic "Value of Health Data" based on the (now adopted) European Health Data Space regulation (EHDS) and the question of how to reward data providers for their contribution to the development of AI models. This year's edition focused on "AI Liability in Health" and the question whether a company, names AI4Mind, can be held liable for damage suffered by patients because of a incorrect diagnose. At the centre of the discussion were the intricacies of the (soon to be published) AI Act , in particular the transparency obligations, and the (Revised) Product Liability Directive .

In the workshop, the moot court participants split in two groups, one representing the patients and the other one the AI company. Additionally, one participant joined our judge, Lorraine Maisnier-Boché. The question at hand, and for which participants needed to argue their case, was whether there is a causal link between the AI company's actions and the damage suffered by the patients. To help the participants to this fictional court case in preparing their arguments to present to the judges, UNIVIE provided "evidence" composed of a detailed dataset description and data governance and transparency measures of AI4MIND. The participants were also provided with key provisions stemming from the (Revised) Product Liability Directive 2022/0302.

The details of the scenario were as follows: This fictional court case takes place in the EU, where an AI model is developed based on MRI image by the company AI4MIND with the aim to assist radiologists in detecting prostate cancer and provide treatment suggestions. Eighteen patients discover that they had been misdiagnosed and suffer from the resulting immaterial damage. Therefore, the group of misdiagnosed patients sues both the clinic and the AI provider. The clinic liability, and the question of doctor's malpractice, is being litigated in a separate trial. Hence, the moot court focused exclusively on the liability of the AI provider.

In 2019, Thomas Davenport and Ravi Kalakota wrote in The Future Healthcare Journal that "[t]here are already a number of research studies suggesting that AI can perform as well as or better than humans at key healthcare tasks, such as diagnosing disease." Even if algorithm are indeed more and more performant, risk

zero does not exist and mistakes, such as misdiagnosis, can happen. But when is a company, providing an AI model assisting a clinician, liable if something goes wrong?

Patients argued they had been wrongly treated which led them to suffer from psychological distress requiring medical treatment. As all eighteen patients share similar Middle Eastern origins, they suspect the AI company did not sufficiently test for bias and did not communicate transparently about the limitations of the models regarding ethnic origin.

The AI company dismisses these allegations arguing that their model was strictly and rigorously tested and validated. Furthermore, the company argues that, as there is no such thing as a zero risk, adverse outcomes resulting from unforeseeable factors or errors made by the healthcare professional are an inherent flaw to AI models itself. They stressed that this is why AI is only assisting medical personnel, who are responsible for the final decision. The participants, in their respective groups, carefully discussed every aspect of the case and the evidence provided and made an argument on how the provisions of the Revised Product Liability Directive would best support their case. After two rounds of arguments and rebuttals, the judge and the assisting judge drafted the verdict.

The decision found the defendant liable for the damage suffered by the patients, because of the defective nature of the AI system. The liability was caused by an insufficient level of information within the product documentation and the limitations of the AI system occurring because of the absence of training and testing on ethnic data. The link of causality between the damage and the defect is based not only on the existence of an autonomous decision by the AI system (medical device) but also by applying the presumption of liability established by the new Product Liability Directive in the context of technical or scientific complexity.

The reasoning of the judgement at length can be found here:
https://blog-idunivienna.univie.ac.at/all-blog-entries/ai-liability-in-health-a-moot-court-organised-by-univie-at-the-cpdp-conference-2024/

We are very grateful to our fantastic participants that brought this fictional court case to life, and we are extremely grateful to our wonderful judge for a second year in row, Lorraine Maisnier-Boché!

[1] *st07553-en24.pdf (europa.eu)*

[2] *Texts adopted - Artificial Intelligence Act - Wednesday, 14 June 2023 (europa.eu)*

[3] *TA (europa.eu)*

[4] *Davenport T, Kalakota R. The potential for artificial intelligence in healthcare. Future Health J. 2019 Jun;6(2):94-98. doi: 10.7861/futurehosp.6-2-94. PMID: 31363513; PMCID: PMC6616181.*

NEWS

Third Dissemination Event of the ProCAncer-I Project in Athens

ProCAncer-I organised the 3rd Dissemination Event of the project at the 21st IEEE International Symposium on Biomedical Imaging, held in Athens, Greece, May 27-30, 2024. During the symposium, ProCAncer-I organised the Workshop "Integrating imaging Data and AI models for supporting precision care through prostate cancer's continuum", on the 27th of May. Prof. Kostas Marias, Prof. Haridimos Kondylakis, Prof. Daniele Regge, Dr. Sara Colantonio and Dr. Manuel Marfil Trujillo discussed and presented various issues on imaging data and AI modeling in the health sector.

Pushing the Limits of Prostate Cancer Diagnosis and Characterization through an AI-based Tools Webinar

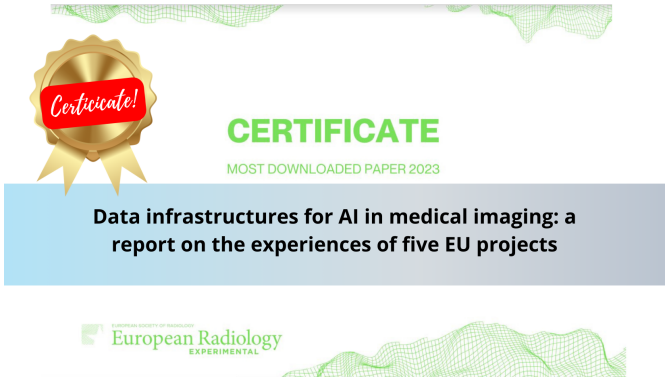
The ProCAncer-I project participated in a webinar exploring the issues and potential of AI in prostate cancer. The webinar was organised by Europa Uomo on January 25th, 2024. The webinar is entitled "Pushing the Limits of Prostate Cancer Diagnosis and Characterization through an AI-based Tools" and speakers were Cosimo Pieri, Prof. Manolis Tsiknakis, Prof. Daniele Regge and Dr. Nickolas Papanickolaou.

ProCAncer-I at the ECR 2024 in Vienna

The ProCAncer-I project was at the European Radiology Congress (ECR) held in Vienna from February 28 to March 3, 2024. Dr Papanikolaou held a presentation, the final outcomes of the PI-CAI challenge were presented, Prof. Kostas Marias gave a lecture and we were awarded with the "Most Downloaded Paper Certificate" for our paper entitled "Data infrastructures for AI in medical imaging: a report on the experiences of five EU projects" published in European Radiology Experimental. Also Prof. Dr. Deniz Akata was awarded the ESR Gold Medal for her contributions.

Our paper in the European Radiology Experimental was awarded with the Most Downloaded Paper Certificate!

Our paper was paper entitled "Data infrastructures for AI in medical imaging: a report on the experiences of five EU projects" published in European Radiology Experimental has received 2980 downloads in 2023 and is, therefore, awarded with a "Most Downloaded Paper Certificate".



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PUBLICATIONS

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2] Anindo Saha, Joeran S Bosma, Jasper J Twilt, Bram van Ginneken, Anders Bjartell, Anwar R Padhani, David Bonekamp, Geert Villeirs, Georg Salomon, Gianluca Giannarini, Jayashree Kalpathy-Cramer, Jelle Barentsz, Klaus H Maier-Hein, Mirabela Rusu, Olivier Rouvière, Roderick van den Bergh, Valeria Panebianco, Veeru Kasivisvanathan, Nancy A Obuchowski, Derya Yakar, Mattijs Elschot, Jeroen Veltman, Jurgen J Fütterer, Maarten de Rooij†, Henkjan Huisman†, on behalf of the PI-CAI consortium‡ (2023). Artificial intelligence and radiologists in prostate cancer detection on MRI (PI-CAI): an international, paired, non-inferiority, confirmatory study, https://doi.org/10.1016/S1470-2045(24)00220-1, The Lancet Oncology, 11 June 2024

3] Almeida, J.G., Rodrigues, N.M., Silva, S., & Papanikolaou, N. (2023). Testing the Segment Anything Model on radiology data. ArXiv, abs/2312.12880

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5] Kondylakis, H., Catalan, R., Alabart, S.M. et al. Documenting the de-identification process of clinical and imaging data for AI for health imaging projects. Insights Imaging 15, 130 (2024). https://doi.org/10.1186/s13244-024-01711-x

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