Newsletter

Summer 2022

In this issue

Editorial 1
UC2: Characterization of cancer according to its biological aggressiveness 3
The Annotation tool by Quibim 4
Curating the data curation tool by ADVANTIS 5
Interview by Luis Marti-Bonmati 6
Advisory Board 7
Partner presentation: QUIBIM, UNIPI, HACETTEPE 9
News 10

ProCAncer-I has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952159

European Commission

Editorial

Editorial by Prof Nikolaos Papanikolaou, Scientific Manager of the ProCAncer - I Project

ProCAncer-I is a collaborative project that combines the efforts of 20 clinical and technical partners in Europe and US. The focus is to collect the biggest in size, diverse dataset called ProstateNET to develop AI models that can address open, unmet clinical questions in the field of prostate cancer. We decided to focus on prostate cancer, since it has a very high prevalence while the current methods and tools referring from early diagnosis to treatment selection and patient management, are not ideal resulting in overdiagnosis and overtreatment in patients with non-aggressive tumors and missed treatment opportunities for patients with aggressive disease.

Therefore, we wanted to incorporate cutting-edge technologies like AI and radiomics to develop models and validate them with the highest standards so they may be used in the clinical practice and improve diagnostic and treatment outcomes. A total number of about 17000 prostate MRI studies accompanied by clinical data are projected to be available in the ProCAncer-I platform. These studies will undergo curation using AI powered tools in the platform to transform them into forms that can be used with machine learning methods to produce clinical value.

The retrospective data collection and uploading is critical to the success of ProCAncer-I, since it will be the backbone of ProstateNET providing a big dataset comprising of several millions of prostate representations visualized with different MRI contrasts (T2, DWI, ADC, DCE), coming from 11 geographically diverse clinical providers. In addition, the clinical institutions are regional private diagnostic centers, public hospitals, specialized anti-cancer centers as well as university hospitals that are reference centers for prostate cancer. Apart from the size of the data, an equally important quality of ProstateNET is the data diversity based on 1.5T and 3T scanners, with or without the use of an endorectal coil, and many different sequence parameter combinations, that brings the ProstateNET very close to real world data. The latter will have very positive effects towards developing not only high performance AI models, but also generalizable which at the moment is the drawback of existing AI models that are not performing as promised in each and every setup (hospital, scanner, protocol, patient cohort).

Following a very tedious standardization process related to data curation, we got managed to agree on the minimum necessary non-imaging clinical variables as well as the type of MRI images that should be present to make a patient eligible for uploading to ProCAncer-I platform. The data curation and uploading process has already started and it is planned to be finalized in month 24, when the necessary computational pipelines for training models will become available. So far about 30% of the projected data has been curated and uploaded to the platform, however we already exceeded the 1.5M images kpi, since at the moment we are approaching 2M images (1.97M). The first wave of retrospective data are used to perform some proof of concept studies related to AI tasks (segmentation, detection, sequence identification, preprocessing pipelines, etc). We are in month 20 of the project and we have already defined the strategy regarding the AI methods to be used

The types of AI or ML models that will be developed and validated under the scope of ProCAncer-i project can be grouped into detection, segmentation and classification models, and these are the main ones to support the 9 clinical use cases. 4 additional models will serve the need to enhance the quality of the data including a sequence identification model, an image quality assessment model, an image denoising model and finally an image enhancement model. Starting with sequence identification, we have experienced very heterogeneous data at the sequence name level, meaning that for the same type of sequence you might encounter different sequence names. This can be explained in the basis of vendor related differences, institution naming strategies or even radiographer preferences since the sequence name is a free text variable that can be entered by the radiographer performing the relative MRI examination. The idea is to use several metadata available in our repository that are extracted from the dicom header of each series, map them to 5 different entities and train a ML model (fig 1).

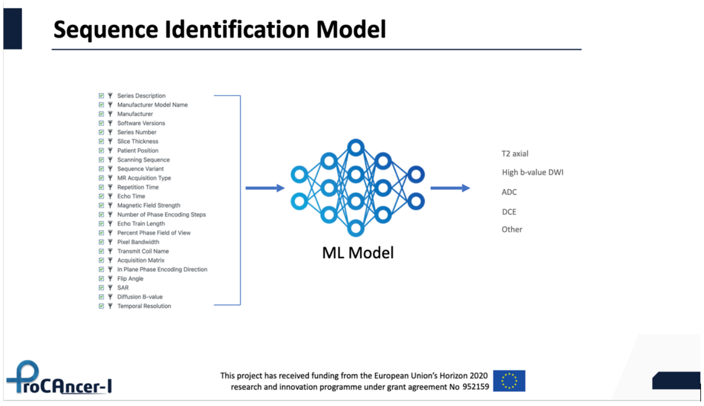


Fig 1. Sequence identification model idea.

In this way the necessary standardization at the sequence name level can be achieved automatically. Another AI model that we are considering is an IQ assessment model that will be trained using as an input the MRI images. In a subset of patients, a group of expert radiologists will provide rates of the image quality that will act as the ground truth to train a classifier.

After training, the model will be deployed on the ProCAncer-I platform and predict the quality of each image that is uploaded prior to its transfer to the prostateNET repository.
This model will guarantee that the repository is not contaminated by exams of unacceptable image quality (fig 2).

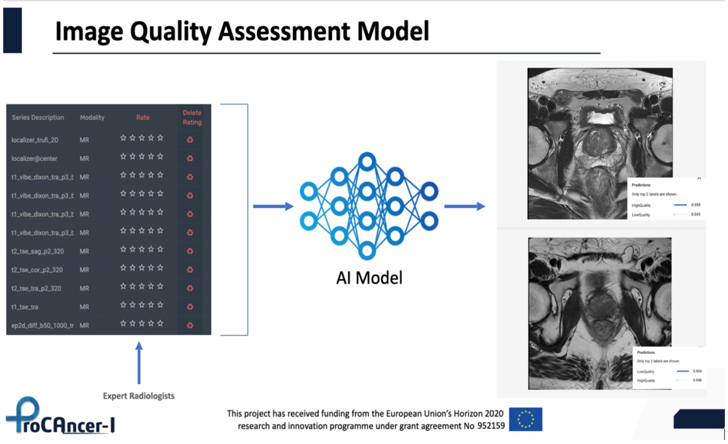


Fig 2. Image quality Assessment AI model

The main AI models that will address all clinical use cases, will be developed based on a three-stage strategy. Initially, we will train models for every UC, making use of the whole retrospective dataset, without making any exclusions vendor wise, protocol wise or field strength wise. These master models will be trained on diverse real-world data and will be used for benchmarking purposes, as well as to act as the back bone of the models at the second stage.

More specifically, and through transfer learning, vendor specific models will be fine-tuned using 20% of vendor specific data of the prospective dataset using the master models as pre-trained architectures. In the third stage vendor neutral models will be developed as meta-learners ensembling predictions from the three vendor specific models. Finally, we will pool the data into three nodes according to the vendor they have been acquired from and train vendor neutral models using distributed learning (fig 3).

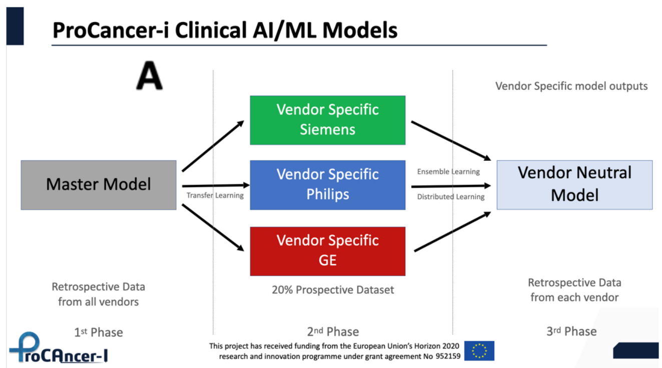


Fig 3. Clinical AI models of the ProCAncer-I project

The detection models will be exclusively based on deep neural network architectures like YOLO5 to either detect the location of the whole prostate gland or the index lesion which is the biggest in size and the most aggressive.

5 models will be trained per category one master model, 3 vendor-specific and 1 vendor neutral model, leading to a total of 10 detection models.

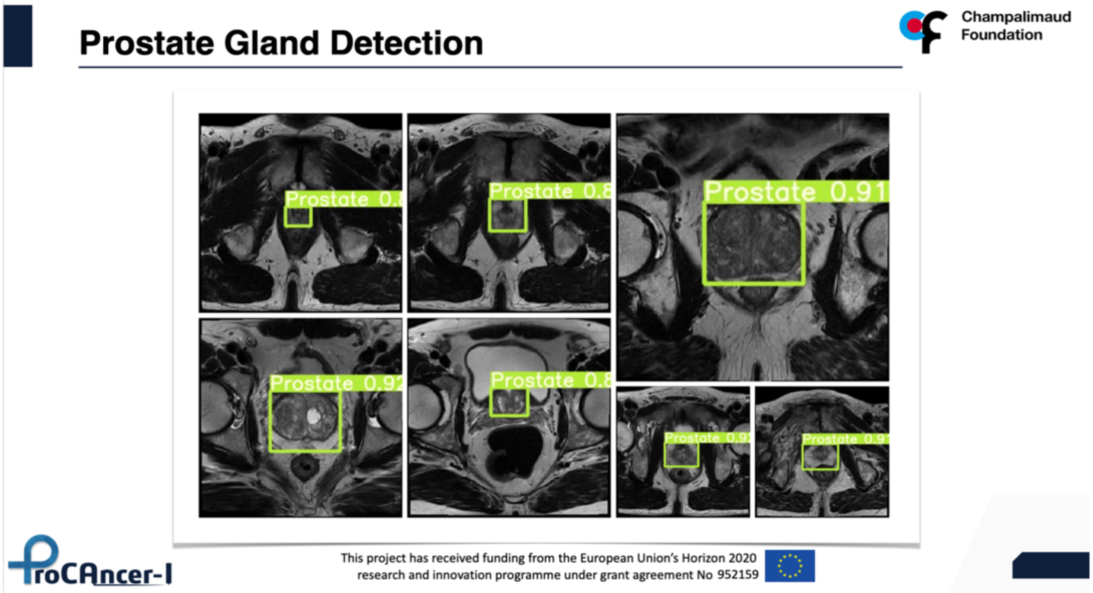


Fig 3. Several examples of the prostate gland detection model, identifying the location of the gland with a light green bounding box, and the relative probability.

In conclusion, the project is progressing fast and the initial results are very exciting and encouraging to continue building upon the ProCAncer-I platform, harnessing the power of high-quality curated data that we are producing, with the ultimate goal to provide to our end-users (clinicians and patients) reliable, explainable and trustworthy AI models that can create value and help individual patients as well as health care systems to improve clinical outcomes in prostate cancer.

UC2: Characterization of cancer according to its biological aggressiveness

By Prof. Daniele Regge, Chief of the Radiology Unit, Candiolo Cancer Institute

Patients diagnosed with localised prostate cancer (PCa) are classified in different risk groups, i.e. low, intermediate or high risk, and this choice will affect treatment and ultimately impact on patients' survival and overall quality of life.

Usually, classification of PCa into a risk class is based on the results of the prostate-specific antigen (PSA), Gleason score retrieved from biopsy, and clinical stage (i.e., TNM). However, systematic biopsy, performed by sampling the gland randomly with retrieval of up 12 tissue cores, underestimates both PCa aggressiveness and tumour extension and may cause pain and local side effects. On the other side, performance of fusion biopsy, where the target is a suspicious region at MRI, is strongly related to the radiologists' experience.

For all these reasons, there is a compelling need to develop tools that can precisely measure PCa aggressiveness without the side effects of biopsy, and support physicians in the selection of the most appropriate treatment option for each individual patient, taking into account tumour heterogeneity.

Use Case (UC) 2 of ProCAncer-I aims to characterize PCa aggressiveness based on MRI by developing an AI signature, i.e. virtual biopsy, providing similar information to that of tissue biopsy.

MRI virtual biopsy might in the future substitute or complement tissue biopsy, limiting the use of the latter to specific subgroups of patients. Moreover, virtual biopsy could hypothetically provide information on cancer aggressiveness of the whole gland and monitor changes in tumour volume and aggressiveness with time.

A fully automatic non-invasive tool based on MRI, providing a likelihood score of PCa aggressiveness, has already been developed and validated on 131 patients (149 tumours) from two different institutions. Preliminary findings are encouraging in distinguishing low and highly aggressive PCa (figure) [doi: 10.3389/fonc.2021.718155]. Within the ProCAncer-I consortium we will have the opportunity to develop and validate prostate virtual biopsy on a much larger data-set, including over 5,000 patients from 13 different European clinical centres.

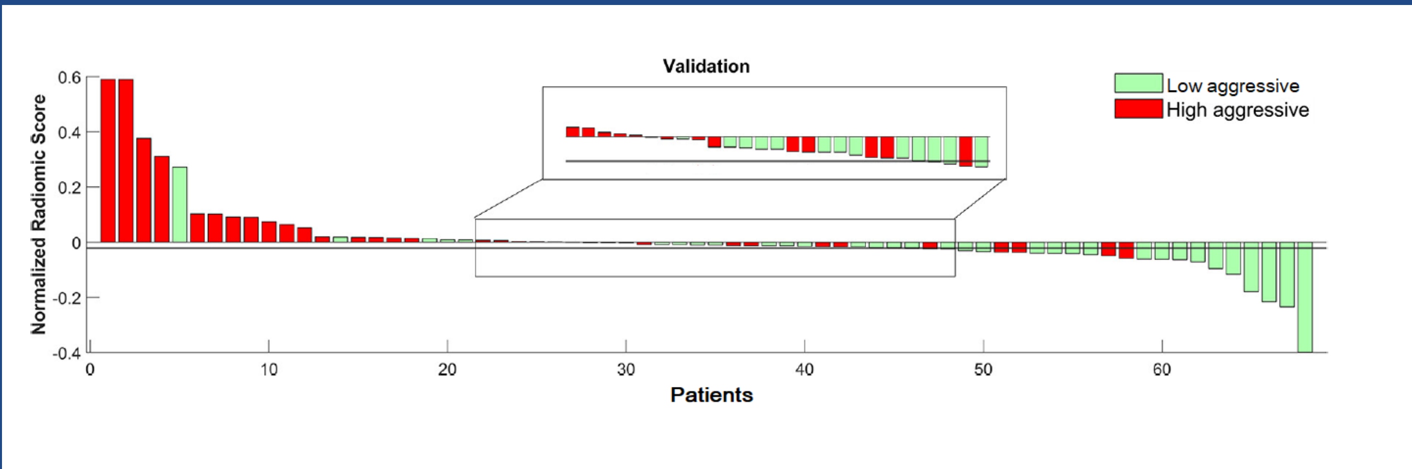


Figure: Waterfall plot of the PCa aggressiveness radiomics score. From the recent ProCAncer-I publication: Giannini V, Mazzetti S, Defeudis A et al. "A Fully Automatic Artificial Intelligence System Able to Detect and Characterize Prostate Cancer Using Multiparametric MRI: Multicenter and Multi-Scanner Validation", Frontiers in Oncology 2021 https://doi.org/10.3389/fonc.2021.718155

The Annotation tool

by Quibim

Quibim set out to transform prostate diagnosis and monitoring by developing a new non-invasive imaging tool using MRI data and advanced computer models to investigate the prostate anatomy in extreme detail. The company has developed AI algorithms for segmentation of prostate gland (peripheral zone, central gland, seminal vesicles) with PI-RADS 2.1 parcellation that can be modified by the experts to store verified annotations and that will be made available to the project. The annotation tool allows to have a concurrent annotation from multiple users, keeping an audit trail that makes secure and reliable use of this data.

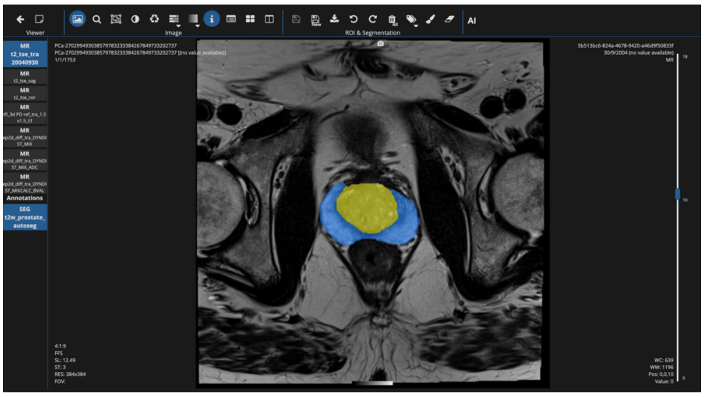
Quibim is in parallel implementing 3 tools and models at the ProCAncer-I project are the following:

- Implementing an image and data annotation tool.
- Developing a system for the monitoring, loging, and retraining of AI models.
- Building AI models for the automatic segmentation of the prostate.

Over the past few months, Quibim has focused on adapting and integrating the Quibim Precision annotation environment into the ProCAncer-I platform. In the project, 5% of the cases uploaded to the platform are being annotated through the segmentation of prostate gland and the lesions. For this purpose, the functionalities of the annotation environment developed by Quibim are being used.

his tool includes some manual annotation functionalities, such as the brush tool, which allows precise delineation of the regions of interest. In addition, for the segmentation of the prostate gland, three different areas are being delineated, including the central/transitional zone, the peripheral zone and the seminal vesicles. Segmenting all these structures from scratch is a time-consuming task. To speed up this segmentation, Quibim has integrated one of the functionalities of its QP-Prostate product, the algorithm for the automatic prostate segmentation. This algorithm generates a pre-segmentation that is reviewed by the radioligists of the consortium who perform its correction for final upload to ProstateNET

All these annotations are stored in DICOM Seg, a standard format of the DICOM standard which allows storing in a single file a binary map of all the annotations made on a specific series, plus additional metadata such as the type of annotation (automatic, semi-automatic or manual), the author or the date together with the reference to the specific series, imaging study and patient. This facilitates the findability, interoperability and reusability (FAIR principles) of these annotations.



Curating the data curation tool

by ADVANTIS

Curating datasets is not an easy task. On the contrary, it can bring about hard-to-solve problems and lead to open-ended discussions, until a satisfactory solution is found. In ProCAncer-I, the curation of medical images has been a challenging task both in terms of computational efficiency as well as in finding a solution applicable among dissimilar images. In this article, we are going to attempt to succinctly describe some of the challenges aside from the technical intricacies.

First of all, ProCAncer-I's curation tool performs two functions: inter-volume motion-correction of a 4D series and co-registration of a series with a T2w (axial) image. Both functions attempt to solve an optimization problem, which may be potentially a time-consuming task and expensive in terms of computing power. Especially, the co-registration function, which may be used to align 3D images with potentially dissimilar characteristics, e.g. quite different signal intensities, such as a T2w and a DW image, can lead to long processing times, until the underlying image registration algorithm reaches a solution. A most common case is the co-registration of a DW high b-value image with a very low signal intensity and a T2w image. In such a case, the co-registration of the two images could fail, which is also the reason such a process cannot be easily fully automated, but rather requires human intervention and inspection of the results. Additionally, tweaking the hyperparameters of the underlying registration algorithm in order to re-run either the motion-correction or co-registration step may seem like an intimidating task due to the fact that these advanced settings require users to understand concepts, such as the number of iterations needed to solve an optimization problem, smoothing using a Gaussian kernel, and image downsampling.

In general, the curation functions can be intensive processing tasks, challenging to fully understand their internals, and intimidating to re-configure in order to improve results. However, various design decisions have been made to improve the overall performance and user experience. They include a simplistic UI, which guides users through the entire curation process step-by-step without the requirement to make intermediate decisions apart from triggering each curation step and assessing the results. Each curation function uses sane defaults, which may be re-configured in an Advanced Settings menu. Furthermore, a plethora of code optimizations have led to reduced processing times and results' improvements. In the future, intelligently re-using previous computed transformations can lead to further improving results, e.g. exploiting an image's successful co-registration to also co-register a derived image of low signal intensity, for which such function would otherwise fail. In conclusion, the curation of medical images is not always a straight-forward task. But, our goal is to curate the curation process, too!

The largest collection of PCa multi-parametric anonymized image data worldwide

Interview with Prof Luis Martí-Bonmatí. Director of the Clinical Area of Medical Imaging Department at La Fe Polytechnic and University Hospital and Head of Radiology Department at QuironSalud Hospital in Valencia

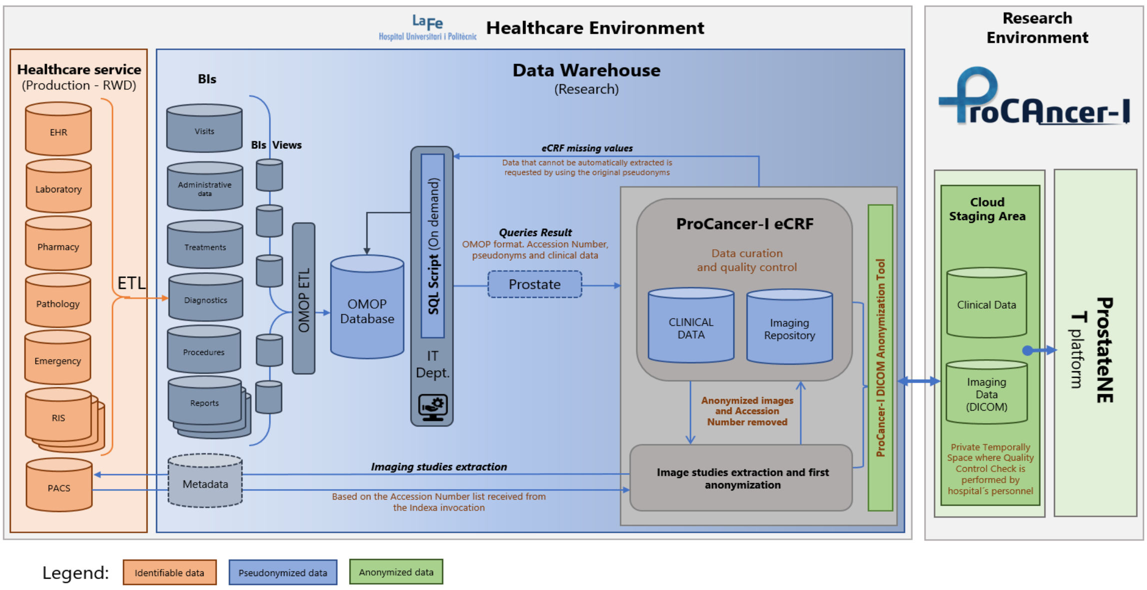
Prof Luis Martí-Bonmatí

In ProCAncer-I you advertise that the platform that will be built will host the largest collection of PCa multi-parametric, anonymized image data worldwide. Why is this so innovational and maybe difficult?

The collection of medical images in standardized and interoperable repositories is a critical step when dealing with observational studies and predictive modelling. A large number of high quality and properly annotated images is necessary to build robust and generalizable AI-based solutions. These images, MR in the case of PCa, must have been acquired in different hospitals, vendors and acquisition protocols to be able to train and validate the computational algorithms and models to allow early diagnosis, adequate phenotyping, and individually-tailored treatments in a real-world clinical environment. In order to implement these solutions in clinical practice, images in these repositories must be harmonized to be vendor-protocol agnostic and comply with a high image resolution quality to avoid potential biases, as well as to incorporate trustworthy automated annotations based on well-established medical imaging standards. This is a huge and complex challenge that is meant to revolutionize the clinical workflow and lay the foundations of the precision and personalized medicine of the future.

What strategies have you adopted to improve the ProCAncer-I data extraction process at your center regarding clinical data?

Our academic hospital has two Data Warehouses (Figure), one for healthcare daily management (primary use) and the other for research on data studies (secondary use). In this way, a segmentation in the accesses and an adequate use of data according to specific needs is achieved. The primary data lake is rebuilt daily via an Extract-Transform-Load (ETL) process. Next, the research data lake is generated on two steps. After an exact copy of the primary Data Warehouse is acquired, the execution of a pseudonymization algorithm allows the generation of this repository for secondary use.



All the information is then standardized with the OMOP Common Data Model (CDM), which allows to extract the needed clinical data in an efficient way.
As all the data in the Data Warehouse is pseudonymized, data can be updated and curated for completeness if any information is missing in the extracted OMOP database. Even more, the process is iterative and missing information allows to improve the ETL script performed to create the OMOP database. In this way, a final robust data warehouse with high quality data is obtained for patients with prostate cancer in the so many clinical scenarios within the complex ProCAncer-I project.

And regarding imaging data? What strategies are implemented in your hospital?
Images and clinical data are related in the Data Warehouse via the DICOM metadata and pseudonymized accession number. Due to the large amount of storage required, images are extracted only on demand as needed within the project. Images are anonymized and stored into our local image repository within the Biomedical Imaging Research Group (GIBI230) facility. The same anonymization code will be used for the clinical, molecular, pathology and imaging data of a patient.

What will be your contribution in the ProCAncer-I in terms of data?
Our hospital is the largest center of the Valencian Community and one of the largest in Spain. The hospital has more than 200 new patients with prostate cancer every year. We will provide at least 900 different cases to the ProCAncer-I platform. Up to now, once the automatic ETL extraction process has been set up and implemented at the Data Warehouse, we have initially identified around 500 cases. At first curation, at least 250 patients have all the necessary clinical variables. These are ready to be uploaded to the last version of the eCRF ProCAncer-I platform.
Further steps will be focused on the recruitment of more patients fulfilling all the Use Cases scenarios within the ProCAncer-I project.

Advisory Board

Prof. Vincenzo Valentini is Professor of Radiation Oncology at the Faculty of Medicine of the Università Cattolica S.Cuore in Rome and Director of the Department of Radiology, Radiation Oncology and Haematology at the Policlinico Universitario A.Gemelli-IRCCS in Rome.
He is Director of AI & Real Word Data and Radiomics laboratories. He is the author of more than 550 publications in peer-reviewed journals and numerous review articles and book chapters. He is a member of the Editorial Board of different journals in radiotherapy and oncology. He was President of ESTRO in 2011-2014.

Prof. Vincenzo Valentini

Dr. Razvan Ionasec is the technical leader for healthcare at Amazon Web Services in Europe, Middle East, and Africa. His work focuses on enabling access and delivery of person-centered healthcare, on improving outcomes and lowering costs by accelerating digitization and utilization of data.
Previously, Razvan was the global head of artificial intelligence (AI) products at Siemens Healthineers in charge of AI-Rad Companion, the family of AI-powered and cloud-based digital health solutions. He holds 30+ patents in AI/ML for medical imaging and has published more than 70 international peer-reviewed technical and clinical publications on computer vision, computational modelling, and medical image analysis. Razvan received his PhD in Computer Science from the Technical University Munich and an MBA from University of Cambridge, Judge Business School.

Dr. Razvan Ionasec

Dr. Ing. Cosimo Pieri is the General Secretary of Europa Uomo Italia Onlus, the Italian Branch of the European Forum, which is the advocacy movement for men with prostate cancer. For the next 3 years he will be part of the board of the Europa Uomo Europe, the central association managing the contacts with the European Institutions and the European Medical Specialists Associations and representing 27 national patients' groups. His work focuses on many aspects :

• improve diagnosis, treatment, support and quality of life of men and patients.
• carry out research and influence policy at national and international level
• work with health professionals to help them understand patient perspectives

Previously, he spent 45 years as Sales Manager for South Europe in Network appliances and software, Graphics Applications, Document Management and Artificial Intelligence solutions at Tektronix Inc, Hummingbird Communications, Open Text and Pitney Bowes . Cosimo received his PhD in Computer Telecomunications from Polytechnic of Milan and and has further taken part at educational courses in Customers Qualitative Business Benefits Improvement Training to Increase Customers Benefits by Innovation and Internationalization .

Dr. Ing. Cosimo Pieri

Harriet Thoeny is an internationally recognized Urogenital and Head & Neck radiologist, currently chairperson of radiology at the Cantonal hospitals of Fribourg, and full professor at the university of Fribourg, the only bilingual University of Switzerland. In addition, she is Adjunct Professor of Urology at the University of Bern in Switzerland. Based on her clinical expertise she is consultant at the Department of Urology at the University Hospital of Bern and consultant at the Department of Radiology at University Hospital of Geneva (HUG), Switzerland.
Harriet always loved foreign languages and cultures (she speaks fluently German, English, French, Italian and some Spanish and Arabic). Her deep interest in human interactions together with her interest in research come together naturally, as her international collaborations show.
She holds/has held several positions at RSNA including associate editor of Radiology, chairperson of the regional committee for Europe, member of the international advisory committee, member of the Margulis award committee and member of the scientific subcommittee of genito-urinary radiology. She has contributed to the international guidelines development including the ESUR/ACR PI-RADS steering committee. She is also member of various scientific committees including European Multidisciplinary Urological Cancer (EMUC) meeting, the European Congress of Radiology (ECR) the International Cancer Imaging Society (I.C.I.S) end the European Society of Urogenital Radiology (ESUR).

She holds/has held several leadership positions also including the presidency of ESUR, where she introduced the European Diploma in Urogenital Radiology and was also an executive board member and Honorary Secretary of the I.C.I.S. She has been chairperson of the Scientific Subcommittees of Head & neck radiology and currently of urogenital radiology of ECR.
Harriet has several peer-reviewed grants totalling several million euros, mainly in functional MR Imaging of the prostate, kidneys, lymph nodes and head and neck imaging. She has published multiple original articles in highly ranked journals including four invited state-of-the-art articles for Radiology. Her work has been read more than 16 thousand times and has been cited more than 10.5 thousand times making her a key opinion leader in Radiology.

She is committed to her clinical work, mentoring and teaching and has given many invited lectures at national and international meetings, in various languages allowing to share her knowledge and culture at the same time. In recognition of her achievements, she was appointed Honorary Member of the Spanish Society of Abdominal Radiology (SEDIA), Honorary Fellow of the Asian Society of Abdominal Radiology (ASAR) as well as Honorary Member of the French Society of Radiology (SFR) and recently honorary member of the Radiological Society of North America (RSNA).

Harriet Thoeny

Presentation of partners

University of Pisa - The Imaging Lab

The University of Pisa is an Italian public research university located in Pisa, Italy. It was founded in 1343 by an edict of Pope Clement VI. It is the 19th oldest extant university in the world and the 10th oldest in Italy. The university is ranked within the top 10 nationally and the top 400 in the world according to the ARWU and the QS.

The University of Pisa is part of the Pisa University System, which includes the Scuola Normale Superiore and the Sant' Anna School of Advanced Studies. The university has about 50,000 students (of which 46,000 are undergraduate and postgraduate studies, and 3,500 are doctoral and specialization studies).

The Imaging Lab is a multidisciplinary laboratory dedicated to frontier research in the study of biomedical images. The head of the Lab is Professor Emanuele Neri, full professor at the Department of Translational Research of the University of Pisa and Chairman of the Diagnostic Radiology at the Pisa University Hospital.

The team consists of several professional figures with different backgrounds and expertise, collaborating in a multidisciplinary context to promote AI solutions in clinical oncology. In particular, radiologists, nuclear medicine doctors, physicists, biologists, and technologists cooperate in several research projects with the aim to develop AI tools in the field of personalized and precision medicine. The imaging-lab is involved in four H2020 European projects, all sharing the purpose of carrying out cancer research and building imaging biobanks that are going to be exploited to collect, archive, and analyze medical images. The Imaging Lab is a hub for exploring new diagnostic and treatment methods in radiology based on AI tools and the activities are mainly focused on the development and validation of imaging biomarkers, imaging biobanks and artificial intelligence solutions. The Imaging Lab works with many national and international research institutions and regularly hosts visiting scientists, post-doctoral fellows and other collaborators.

http://imaginglab.med.unipi.it/

QUIBIM, QUantitative Imaging Biomarkers In Medicine

Quibim is the go-to imaging partner bringing virtual biopsies to diagnostics and drug discovery. By following an AI-first approach to help detect pathologies and predict outcomes in oncology/immunotherapy, rheumatology and neurology. The company is specialized in tissue profiling at every body part and imaging modality, Quibim develops novel quantitative imaging biomarkers to deeply analyze disease mechanisms, advancing in drug discovery and monitoring treatment progress. Using the power and promise of quantified imaging data and AI, Quibim makes precision medicine a reality.

The company is made up of a team of professionals such as biomedical engineers and medical doctors with wide experience and recognized scientific career in the field of medical imaging to further develop the technical activities of ProCAncer-I providing the appropriate annotation and segmentation tools for Prostate MRI data. Related to legislative and regulatory framework for the developed models, as well as exploitation and sustainability approaches, Quibim is supported by their cross-cutting and multidisciplinary team with deep knowledge in Quality, Regulatory Affairs, Innovation and Legislation.

Hacettepe University - Department of Radiology

The Radiology Department of the Hacettepe University is located in Ankara, Turkey. With decades of experience, all radiologic imaging procedures as well as interventional radiology services in scope of modern medicine are performed by the experienced and specialized staff, particularly the academic staff and instructors of Hacettepe University Faculty of Medicine Department of Radiology.

The team members involved in the ProCAncer-I project, are academic staff of abdominal radiology section. The department is dealing with prostate imaging for the last 30 years. The non-vascular interventional section performs all types of prostate biopsies including MRI/TRUS fusion biopsy.

The role in the ProCAncer –I project is to collect retrospective and prospective data. The personnel involved are : Deniz Akata, MD (PI), Mustafa N. Özmen, MD, Musturay Karcaaltıncaba, MD, Ali Devrim Karaosmanoğlu, MD

HACETTEPE
University

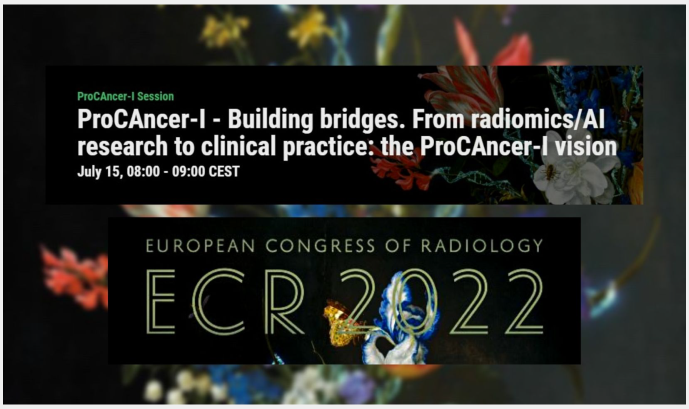
News

1st Dissemination Event in Vienna

We are really happy to announce that we will be present at the ECR Congress in Vienna on 13 – 17 of July 2022. During the congress, a special Session will take place on the 15th of July, presenting and discussing on the ProCAncer-I project with the title:

Building bridges. From radiomics /AI research to clinical practice: the ProCAncer – I vision

The presentation and panel discussion will take place with both members of the ProCAncer -I project as well as the FUTURE – AI initiative, starting at 08.00 CET. For more information about the Congress and registration: https://www.myesr.org/congress



QUIBIM'S EuroMinnies 2022 Award

Quibim proudly wins the EuroMinnies 2022 Award for the Best New Radiology Software. A huge shout out to the R&D team at Quibim for all the efforts in building the software QP-Prostate®.

This tool offers a fundamental change in analyzing prostate MRI exams by helping radiologists improve their workflow and support their accurate decision-making. Aiming to improve human health through AI-guided precision medicine. AuntMinnie.com Read the full article: https://bit.ly/3oUnPeZ

ProCAncer-I in the IEEE-MeMeA Conference

At the 17th edition of IEEE International Symposium on Medical Measurements and Applications, Dr. Valentina Giannini (FPO) and Dr. João Santinha (FCHAMP) will chair a special session (no.14) entitled “AI-Powered Medical Image Analysis: Radiomics For Personalized Patients’ Management”. The session is designed to cover all aspects related to the development of AI-based imaging biomarkers and techniques, for personalizing management of patients and including the challenges which need to be addressed before translation of AI to clinical use, regarding explainability of the models, reproducibility of quantitative imaging features, sensitivity of the results to image acquisition and reconstruction parameters. In this special session, Dr. Giovanni Maimone (FPO) will present a study entitled “Comparison of Machine and Deep Learning models for automatic segmentation of prostate cancers on multiparametric MR” acknowledging the Pro-Cancer-I project. For more information about the Conference: https://memea2022.ieee-ims.org/

more news

Publications

1] Eva Pachetti, Sara Colantonio and Maria Antonietta Pascali (2022), “On the Effectiveness of 3D Vision Transformers for the Prediction of Prostate Cancer Aggressiveness“ , MEDTX – International Conference on Image Analysis and Processing ICIAP21 23-26/05/2022

2] João Santinha, Linda Bianchini, Mário Figueiredo, Celso Matos, Alessandro Lascialfari, Nikolaos Papanikolaou, Marta Cremonesi, Barbara A. Jereczek-Fossa, Francesca Botta and Daniela Origgi (2022), “Discrimination of Tumor Texture Based on MRI Radiomic Features: Is There a Volume Threshold? A Phantom Study”, https://doi.org/10.3390/app12115465, on line 27/05/2022 by MDPI in Applied Sciences

more publications

Subscribe to our **Newsletter** and **follow us** on **Social Media!**

Check our **Website**: **https://www.procancer-i.eu/**

Follow us on **Twitter**: https://twitter.com/**ProCAncer_I**

Like us on **Facebook**: https://www.facebook.com/**ProCAncer.I**

Follow us on **LinkedIn**: https://www.linkedin.com/company/**procancer-i-project**

FORTH
INSTITUTE OF COMPUTER SCIENCE
COMPUTATIONAL BIOMEDICINE LABORATORY

Champalimaud Foundation

HACETTEPE ÜNİVERSİTESİ

dIB Gi

ISTITUTO DI CANDIOLO - IRCCS

IN SUPREMÆ DIGNITATIS
1343
UNIVERSITÀ DI PISA

Radboudumc

INSTITUT PAOLI-CALMETTES
unicancer Marseille

NACIONALINIS VĖŽIO INSTITUTAS
NCI

Instituto de Investigación Sanitaria La Fe

Consiglio Nazionale delle Ricerche

The ROYAL MARSDEN
NHS Foundation Trust

JCC
DIAGNOSTIC IMAGING

ΑΓΙΟΣ ΣΑΒΒΑΣ
ΓΕΝΙΚΟ ΑΝΤΙΚΑΡΚΙΝΙΚΟ - ΟΓΚΟΛΟΓΙΚΟ ΝΟΣΟΚΟΜΕΙΟ ΑΘΗΝΩΝ

quibim

universität wien
Department of Innovation and Digitalisation in Law

ADVANTIS
MEDICAL IMAGING

Biotronics 3D

MASSACHUSETTS GENERAL HOSPITAL
MGH

quirónsalud
La salud persona a persona