

**Activity report: Attendance to ESMPE course  
“Artificial Intelligence in Medical Physics”  
(5<sup>th</sup> – 7<sup>th</sup> October 2023 in Prague, Czech Republic)**

The course “Artificial Intelligence in Medical Physics” was organized by the ESMPE (European School for Medical Physics Experts), of EFOMP (European Federation of Medical Physics), in collaboration with CAMP (Czech Association of Medical Physicists) and COCIR. The onsite part was held in Prague from 5<sup>th</sup> to 7<sup>th</sup> October 2023, the venue being the Institute for Clinical and Experimental Medicine (IK + EM).



The course was composed of lectures and a practical session. The content was oriented towards the application of Artificial Intelligence (AI) models on tasks performed by Medical Physics Experts (MPEs), as well as their role in evaluating the performance of these models both in the short and long term.



The event was divided into several sessions. First, on AI for dose and protocol optimization in radiology (with focus on CT, CBCT and MR), radiotherapy and nuclear medicine, highlighting the main clinical and research applications in each field, such as data processing, image reconstruction, noise reduction, optimal treatment calculation, plan automation, image post-processing and patient dose reduction. Secondly, on AI for

workflow optimization and automation, especially focused on the integration of AI-generated reports in radiology and automated workflows in radiotherapy, including automated segmentation and planification, adaptive radiotherapy and automated

quality assurance (QA). In the third place, the course gave some insights on the QA required for AI medical devices. It gave an overview of the procurement, acceptance testing and commissioning of an AI tool, as well as some practical approaches for data collection, curation, and storage of AI models, which was accompanied by a hands-on example using ITK-Snap and an online available repository. Finally, the impact and risks of the use of AI in clinical settings was also considered, as well as the regulatory aspects that AI applications must comply with. In this part, we were provided with practical guidelines on regulatory aspects in both Europe and the US, and the specific role that the MPE will play on their application. The last day, the sessions were conducted by five representatives of companies with medical solutions based on AI. They presented their products, which were focused on breast cancer (*Hera-Me*, *ScreenPoint*, *Tecnologie Avanzate*), prostate cancer (*Quibim*) and early stroke detection (*Brainomix*), as well as their commercial perspective of the application of medical AI products. The session closed with a panel discussion on how MPE and industry can collaborate to ensure the safe use and performance of AI tools in a clinical environment.



At the end of the course, we took a final examination to that covered some of the most important topics presented by each of the speakers. Coffee breaks, lunch time and the social dinners were an excellent opportunity to make contacts, exchange opinions and discuss about the present and future of AI in the medical field.

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