

# AI4Health Winter School

## AI4Health : A week full of learnings for AI in health

The first edition of AI4Health Winter School, dedicated to artificial intelligence (AI) applied to health, took place from January 4th to January 8th, 2021. Co-organized by the Interdisciplinary Institutes of 3IA ([Prairie](#), [MIAI Grenoble](#), [3IA Côte d'Azur](#)) and the [Health Data Hub](#), the virtual edition of AI4Health brought together more than 350 participants from 30 countries, with varied profiles (60% students, 20% academics and 20% private sector professionals). This first Winter School was made possible thanks to the support of 12 partners and is just the beginning of a cycle of other AI4Health Schools to come. Participants underlined the academic quality of the plenary sessions and practical sessions and obtained a lot of inspiration for their research and work.

Plenary sessions presented by internationally renowned researchers on their research works in AI applied to health during the first three days were followed by two days of practical sessions.

The inaugural session (which can be [viewed online](#)) illustrated the key role of all AI4Health co-organizers in promoting AI for health research in France, through cutting-edge academic programs, open to internationals, and innovative public-private partnerships.

The Winter School Partners Roundtable was another highlight, bringing together experts to discuss initiatives and concrete applications of AI in health for the benefit of patients. [The replay is available here](#).

AI4Health engaged all its participants: 90% of them rated the plenary sessions as 'good' or 'excellent'. Nearly 90% would be interested in a new edition. We are already pleased to announce the next AI4Health Summer School, stay tuned for the announcement of the dates.

More than 75% of participants felt that the Winter School was 'relevant' or even 'very relevant' regarding the quality of the research presented. In terms of new skills acquired, the average score was 8, on a scale from 1 to 10.

On Twitter, one participant described the Winter School as "Fantastic with incredible speeches." Another found Adrian Weller's session "inspiring", and several participants thanked the organizers for offering them the opportunity to present their research during the Posters session. 96% would recommend AI4 Health to a friend or colleague!

The entire AI4Health team would like to thank the speakers and participants for their involvement.

To learn more about the Winter School, here's an article below, detailing the event day by day.

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## AI4 Health, a day-by-day overview of an exciting week of learnings

### Day 1

On the first day, **Emmanuel Bacry**, Chief Scientific Officer of the Health Data Hub, summed up the stakes of the Winter school to kickstart the opening ceremony : *“if you’re with us today, it’s because you’re convinced that potential for AI in the health field is immense. AI could help us to better understand pathologies or patients’ needs, to improve diagnostics, personalized medicine, pharmacovigilance, clinical trials.. [...] Allow me to highlight what I think is one of the driving forces of AI4 Health : interdisciplinarity. Gathering health professionals and scientifics from different fields to exchange ideas, work together, that’s how IA can be used for revolutionnary purposes in health research”*.

**Stéphanie Allassonnière** then presented PRAIRIE, **Nicolas Ayache** the 3IA Côte d’Azur Institute and **Alexandre Moreau-Gaudry** MIAI Grenoble. These three cutting-edge structures rely on several national and international public-private partnerships. They presented their academic programs to attract students and researchers from all around the globe. Afterwards, Emmanuel Bacry presented the Health Data Hub. This relatively new French public structure allows leaders of research projects of public interest to access health data in an easy, unified and secure manner. A technological platform supporting the development of AI tools is made available to these project coordinators, under strict security conditions and in accordance with citizens’ rights. The Hub is a new structure and is currently growing.

The first speaker of the plenary session, **Adrian Weller** (Alan Turing Institute, Cambridge University), gave an overview of the ethics and transparency issues that are critical around AI. **Pearse Keane** (UCL Institute of Ophthalmology, Moorfield’s Eye Hospital, UK) then spoke about the transformation of health systems through AI, with a special focus on its field of expertise, ophthalmology. Finally, **Dorin Comaniciu** (Siemens Healthineers) resumed this first day with a keynote on the perception of AI in the medical field, shifting from a trend to a real added-value.

Participants were also able to discover around forty posters presented by their authors on the platform. For example, an innovative work on *“helping the management of insulin and alimentation with learning for type 1 diabetics”* was presented. This project offered a concrete solution for diabetics patients during the Covid-19 outbreak. Another poster sought to *“compare information on pharmacogenomics”*, through PractiKPharma, a research project funded by the French National Research Agency (ANR). It aimed at developing information extraction methods from expert databases, scientific literature and digital health files, in order to compare them. .

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## Day 2

The second day was marked by the plenary session of **Michael Bronstein** (Imperial College London), who presented Deep Learning methods' evolutions and the need to go beyond euclidean data to be able to manage complex geometries associated with graphs. **Barbara Engelhardt** (Princeton University, USA) presented Machine Learning integration in hospital systems, and the potential to improve patient care.

At the end of the day, Diamond partners of AI4 Health were able to express their opinions as part of a roundtable, moderated by **Stanley Durrleman** with **Rui Fa** (Elsevier), **Rémy Choquet** (Roche), **Nigel Hughes** (Janssen) and **Mérouane Debbah** (Huawei). They debated about concrete applications of AI in healthcare, the definition of best practices and future opportunities. The conversation benefited from the knowledge and engagement of the participants.

Stanley Durrleman recapitulated the stakes of the conversation in his introduction : *"if this program is very biased towards algorithms and methods, it can only represent the tip of the iceberg. When it comes to the unfolding of these tools in the real world, with real patients, the process often becomes much more complex"*. Each speaker explained his actions with these tools, though there was consensus that data would become the major issue of the 21st century. Nigel Hughes added that *"AI consumes data like a voracious monster"*.

## Day 3

On the third day, **Sophia Ananiadou** focused her speech on the key methods of Biomedical Text Mining - a set of computer treatments that extract knowledge based on a novelty or similarity criterion in human-produced texts for humans, and their concrete applications. She focused on methods developed at the National Center for Text Mining ([www.nactem.ac.uk](http://www.nactem.ac.uk)), some of which include automating the systematic review process (RobotAnalyst), annotation tools using active and proactive learning (APLenty), semantic faceted search engines (Thalia), and time-sensitive research for the history of medical texts (HoM).

**Susan Murphy** concluded the plenary sessions with her presentation of the challenges that the development of online learnings and experimentation algorithms represent in the field of mobile health.

At the end of the first three days came the Networking Session, that gave the chance to partners and participants to meet each other. This session was developed on an individual meeting model, that allowed candidates to schedule meetings with AI4 Health partners to discuss eventual career opportunities and share their respective CVs as a follow-up.

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## Day 4 & 5

The last two days were reserved for practical hands-on sessions. All in all, it encompassed a dozen sessions with 20 people maximum, which had been rigorously selected by the AI4Health scientific committee. For example, **Ninon Burgos** of PRAIRIE conducted a session on Deep Learning applied to medical imaging, with a focus on two topics : classification within computer-assisted diagnostics and image synthesis. Another session organized by **Alexandre Gramfort** from INRIA allowed participants to learn more about Machine Learning approaches for electrophysiological EEG (electro-encephalography) and MEG (magnetoencephalography).

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