

# Human-Centric ICT for Industry 5.0

## Content

**2024 Participant Description**

**2024 Edition schedule**

### **Anonymous Form results:**

**This anonymous form was completed at the end of the summer school 2024 Edition**

**Other intermediate forms were adopted during the summer school**

**At the end of these slides, we will describe some changes we will apply to Summer School 2025 Edition**

# Participants

17 PhD. Stud.

5 M.Sc. Stud.

3 Professionals in the IT/health sectors.

2 students B.Sc.

## 1 Researcher



# 2024 Edition Program

Monday 9	Morning	Afternoon
	Intro HCS for I5.0 (Prof. Nicola Vanello) 9:00-10:30 am	(Dr. Lorna Vatta, Executive Linfa Digitale S.r.l.) State of the art 4.0 and/or Challenges for 5.0 implementation 2:00-4:00 pm
	Industry 5.0: Myth blasting (Prof. Gualtiero Fantoni) Monday, 10:30 am-1:00 pm	The success of innovation and the inertia of the market and consumers (Dr. Alessandro Bruni, Naima Consulting) 4:00-6:00 pm
Tuesday 10	Morning	Afternoon
	Models of emotions and estimation from physiological signals (Eng. Mimma Nardelli) 9:00-11:00 am	LLMs for Industry 5.0 ( Prof. Nicola Tonellotto ) 2:00-4:00 pm
	Personalized Human-Machine Interfaces via Brain-Heart Interaction (Prof. Gaetano Valenza ) 11:00 am-1:00 pm	RFID technology for automatic identification and sensing (Prof. Alice Buffi ) 4:00-6:00 pm
Wednesday 11	Morning	Afternoon
	Partners in Control: Exploring Human-Machine Teaming (Eng. Andrea Munafò) 9:00-11:00 am	The Transformation of Telecommunications to Support Industry 5.0 (Prof. S. Giordano ) 2:00-4:00 pm
	Human monitoring: new approaches to Sensor Fabrication and design (Prof. Giuseppe Barillaro ) 11:00 am-1:00 pm	Federated Learning of Explainable AI models (Prof. Pietro Ducange ) 4:00-6:00 pm

Thursday 12	Morning	Afternoon
	Human-in the loop - robotic systems and haptic interfaces (Prof. Matteo Bianchi ) 9:00-11:00 am	Technologies for Affective State monitoring (Prof. Enzo Pasquale Scilingo ) 2:00-4:00 pm
	AR&MR applications for education and training (Eng. Sara Condino ) 11:00 am-1:00 pm	Autonomous Environmental exploration (Prof. Manolo Garabini ) 4:00-6:00 pm
Friday 13	Morning	Afternoon
	Energy Sustainability: a perspective on advanced management of lithium-ion batteries (Prof. Federico Baronti) 9:00-11:00 am	Assistive technologies (Prof. Luca Fanucci ) 2:00-4:00 pm
	Federated learning and model personalization (Prof. Alessio Bechini ) 11:00 am-1:00 pm	One Health Principles in Engineering design (Prof. Arti Ahluwalia) 4:00-6:00 pm
Saturday 14	Morning	Afternoon
	Radiolocalization techniques to enhance safety in workspaces (Prof. Paolo Nepa ) 9:00-11:00 am	
	Accurate AR&MR guidance (Prof. Vincenzo Ferrari) 11:00 am-1:00 pm	

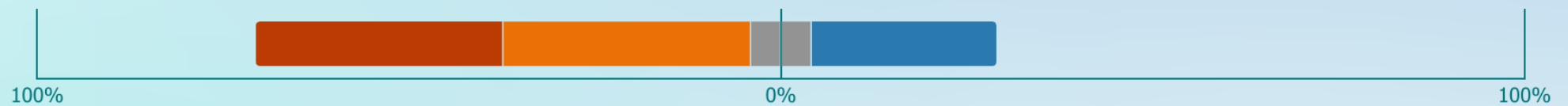
# 2024 Edition

## Participant survey results

24 risposte inviate

# The number of lecture hours was appropriate.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree



**Please, if relevant, leave an adjective about time schedule**

*A bit overwhelming*

*Optimal*

*I think that lecture hours were a bit too much. I would have preferred less lecture hours and more activities/laboratories*

*greater*

*I think it would have been better to have three lectures a day instead of four.*

*I think the timetable is perfectly adequate.*

*Intense*

*Very good the timing of 45 minutes per slot  
tight*

*The only thing I would have changed was to make the lectures 1 hour 15 minutes with a 15 minute break in the end.*

*packed*

*A little bit demanding*

*Perfect!*

*I think maybe maybe three sessions per day would be enough or having four sessions that last 1.5 hours and have no breaks. In general, I think it might have been better if there had been less breaks but the education had ended around 4 or 5pm.*

24 risposte inviate

My previous knowledge to understand the lectures was: 1 not sufficient - 5 perfect

3.75



0%



0%



41%



41%

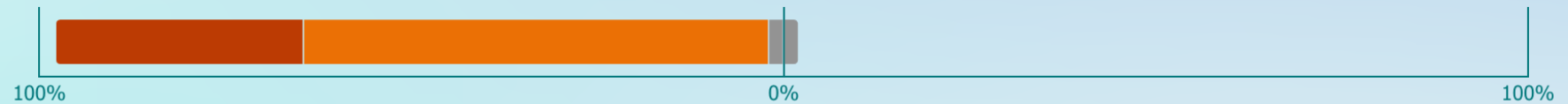


16%

24 risposte inviate

## The lectures were well simplified with proper examples

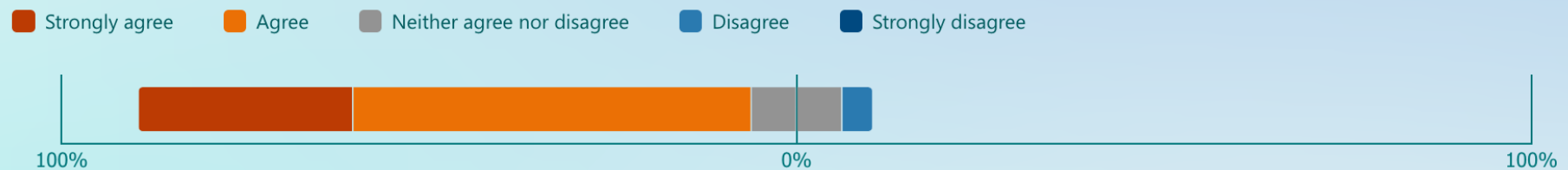
Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree





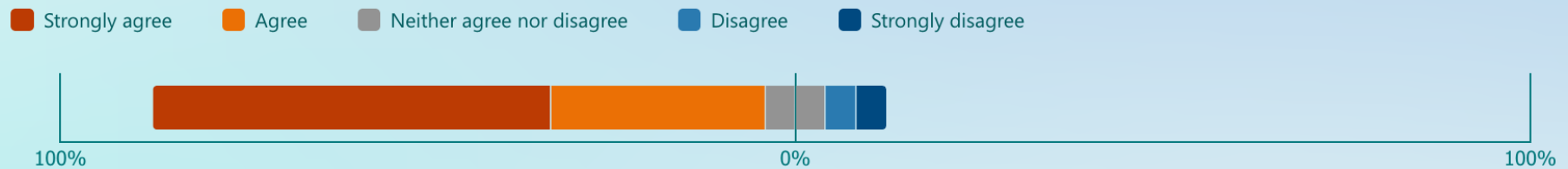
24 risposte inviate

There were sufficient cross-links between the different lectures to understand the coherence



24 risposte inviate

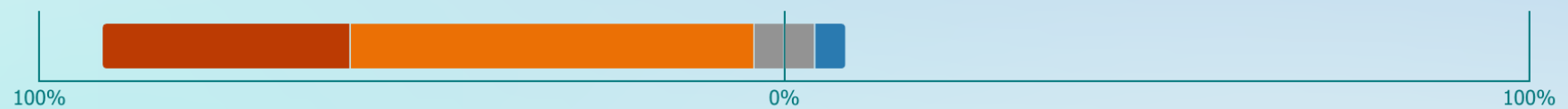
My state of knowledge about I5.0 and I4.0 is substantially higher than before the School Start



24 risposte inviate

## The summer school in line with what you expected

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree



**The summer school in line with what you expected (we asked to comment about that)**

*The group activity after "One health" lecture was very engaging. This could be one way to mix ideas of participants from different backgrounds and professors.*

*I expected a bit more of an Industry 5.0 connection, but I also kind of expected it to be a bit technical at times.*

*I have liked the seminars, they give some insight very useful*

*Sometimes I missed the links to Industry 5.0.*

*Expectations were fully met.*

*In line with my expectations regarding lectures*

*The summer school was very well structured covering many topics in I5.0. My only wish was that the applications for some of the topics would have been more covered rather than the theory.*

*I think the school only had a technical, IT-related focus. I think examining the topics also from a more social side could be very interesting (e.g. ethical, privacy or cultural perspectives). I think one good example for that was the lecture about One Health Approach and Holistic Engineering.*

*The summer course was a exceptional opportunity to get an overview on the capabilities of industry5.0 and related areas.*

*I thought there would be more workshops like on Friday*

*I found the lectures on federated learning very interesting (they were the reason for participating in the summer school). Congratulations.*

24 risposte inviate

How would you rate the content of the lectures (1 not interesting - 5 very interesting)

4.13



0%



0%



12%



62%

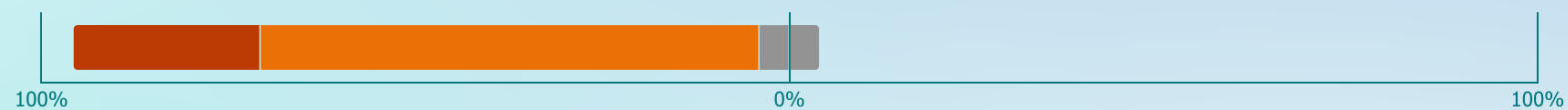


25%

24 risposte inviate

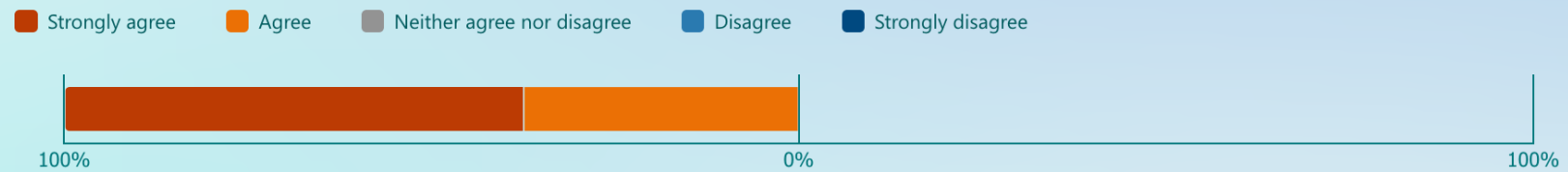
The speed of knowledge transfer was appropriate.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree



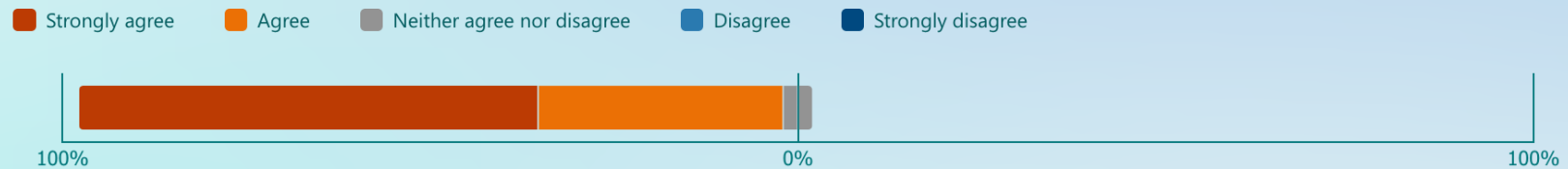
24 risposte inviate

The lectures were rich in variety.



24 risposte inviate

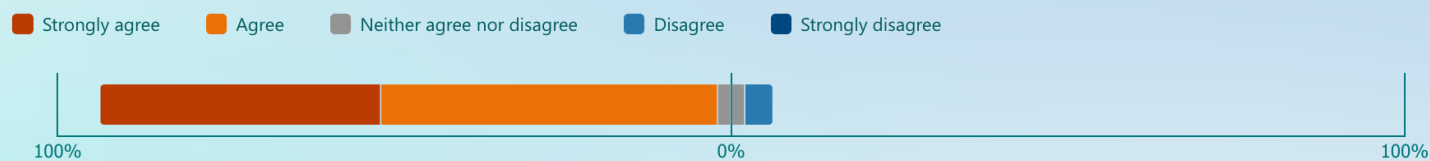
The atmosphere during the lectures was pleasant.





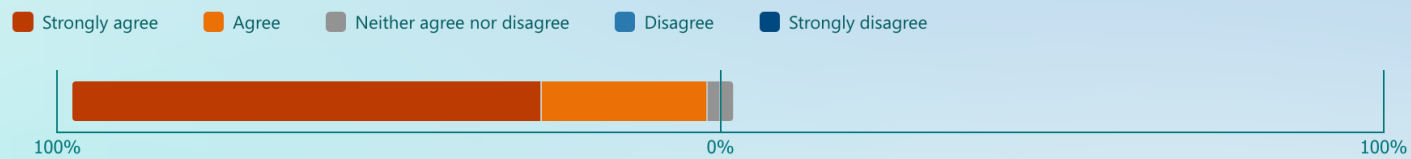
24 risposte inviate

The linguistic style of the teachers was fluent and clear.



24 risposte inviate

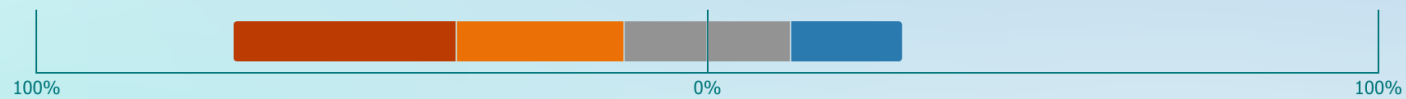
## The teachers appeared well prepared



24 risposte inviate

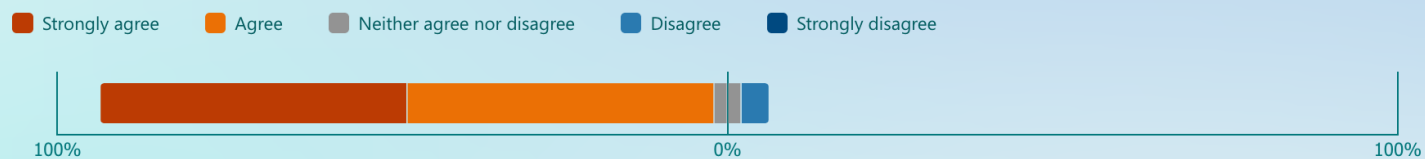
## The project-work goals and format are clear

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree



24 risposte inviate

The students had the opportunity to participate actively.



24 risposte inviate

How much do you believe that you found concepts that can be applied immediately in your work? (1 very little- 5 strong belief)

3.65



## What did you like? 1/2

*Diversity of topics and speakers.*

*The Restaurant visit was very great. Also the professor being open for questions at the end of the presentations as well as Prof. Vanello being open for any requests from the students even apart from the lectures e.g. food at the cafeteria etc. Also starting the lectures at 9 AM instead of 8 AM was very good 😊*

*The wide variety of the professors who conducted the lectures*

*I found it very useful that the professors interacted with the participants by asking questions or doing exercises. This gave us the opportunity to bring the different perspectives together. I also really enjoyed the social event on Thursday. It made me feel more connected to the other participants.*

*I had like the mixing between the various engineering disciplines and how these could be inserted in an industry 5.0 scenario*

*The compactness of the summer school. That so many were in Pisa and not just online and the lectures about LLMs.*

*I found the lectures on "Federated Learning" were particularly interesting (this is the main reason why I attended this wonderful summer school)*

*I liked the precise way it was organised. I liked the diversity, that we had 22 professors who gave lectures. I truly appreciated the huge variety of examples, the interesting facts, detailed explanations. All professors were very well-prepared and had a really engaging presentation style. They were approachable, we could ask questions anytime and were encouraged to even ask questions via mail if we had any. I think it is a very supportive approach.*

## What did you like? 2/2

*The course subject, the caring, the teachers, the overall experience*

*The course overall materials and explanations provided by professors.*

*All lectures*

*the lectures about RFID and Brain Wave were really interesting. Many lectures were described the topic with many examples, and it made me easy to understand.*

*The topic I liked the most was the discussion on two different days of "Federated Learning". I particularly appreciated it because it is my doctoral research focus. With this opportunity I will try to contact the professors who I appreciated and with whom I would like to explore further possibilities for deepening federated learning.*

*Lectures*

*The variety of the topics and the overall atmosphere of the summer school.*

*It was interesting learn something new even not directly relate to my current work*

*The variety of subjects*

## **Describe what you did not like**

*Room temperature, only one team activity. Team activities or task has to be more for best engagement.*

*Perhaps there could be more activities for the students to engage such as group activities.*

*No comment.*

*Sometime the environment was a bit noisy, but in general was a very good experience*

*The length of the sessions. I think I would have liked it more to have a 1.5 long session without any breaks, then have 15 mins of break. I think this way the day would not feel super long, and students could keep up their focus more easily.*

*Too many direct lectures, more engagement especially after lunch*

*Nothing*

*group work was a bit confusing what we need to do.*

*nothing*

*Practice and/or workshops were missing*

*The long hours and a more theoretical approach in some of the topics.*

*I would have liked it if there had been time slots to work on or at least start the final project during the summer school, in order to have a more direct exchange with the other participants and with the teachers.*

*The number of hours*



## What would you suggest to improve the Summer School? 1/2

*Further time for discussion in between the participants.  
Speakers and participants.*

*On my side i wish we were able to get to know the other  
participants better. This could be done by a short introduction  
at the beginning of the summer school as well as name tags  
with the field of study as well as the university/country.*

*More engaging activities during the lectures*

*More social events! :)*

*To improve the distribution of the lectures' topics*

*I think that the Summer school was well organized*

*Maybe one larger break in the morning and one in the  
afternoon and otherwise only five minutes, because the breaks  
were quite short to get a coffee in the bistro.*

*I think it was a bit difficult to connect with other  
participants in the beginning, we had one social event in  
the end of the week which was truly amazing. I think  
some more social events would be fantastic.*

*Social Event on the first day to get to know the other  
participants better*

*May introduce some visits to related players (university  
departments) and near companies on the field.*

*Nothing*

*Maybe it'll be better if the lecturers share the ppt before  
the lecture*

*Workshops/Group work*

## **What would you suggest to improve the Summer School? 2/2**

*My focus is on Federated Learning and I would like to address it in a further in-depth and extensive way, also with applications in the healthcare sector and laboratory activities.*

*Student activities (workshop, presentation, mini-project...)*

*I would suggest either reducing the theory and shift the focus on application or if necessary reduce the variety and give certain topics more time so both the theory and the application is sufficiently covered.*

*More group and practical activity*

*Less hours or more hours for students projects*

**Any comment about the enrollment process**

No.

*Was alright, cant complain*

*No comment*

No

*Was easy and straightforward.*

*I think the enrolment process went smoothly, I mainly followed the steps on the website and in the Alice Portal. I would have liked to receive a list of academic articles that we could have read before the start of the summer school.*

*Quick and efficient.*

*It is done right*

*Alice portal was a bit difficult to understand since I don't kr about Italian language and did not have the Italian tax cod*

*Easy*

*The registration process was perfectly adequate.*

*It was very straight forward and easy to follow.*

*Easy to apply*

### **Was it easy to find an accomodation?**

*When booking in advance it was relatively easy to find cheap and good accomodations for 25-30€ a night*

*yes*

*Yes, but it might be nice to suggest a hostel. We usually did something together after summer school anyway.*

*Yes*

*I attended remotely and it was perfect for my work and academic needs.*

*Yes*

*N/A*

*Not so really, because it is quiet difficult to find an AirB&B for one person, and therefore mine was not very central what was especially in the evening not so nice.*

*I did find accommodation easily as I did it a couple of mont advance, however if the lecture hall's address was finalizea sooner I would have chosen a different place.*

*It was relatively easy to find an accommodation.*

*In advance yes. A bit expensive*

*I went online, so can't speak on this matter.*

# Human-Centric ICT for Industry 5.0

The time allocated for project team work will be tripled (three afternoons will be dedicated).

As a result, the number of theoretical lessons will be slightly reduced.

The final project will be initiated and developed during the summer school.

A social event will be organized on the first day.