The Digital Manufacturing and Design (DiManD)

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Deliverable 2.5

School #4 Mixed Reality Systems

February 2022

Lead parties for Deliverable: STIIMA
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Dissemination level: Public

1 (**19**)

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Summary

This deliverable presents the "School #4: Mixed Reality Systems" organized by STIIMA beneficiary.

Team involved in deliverable writing: MGEP, STIIMA

1 Introduction

DiManD "School #4: Mixed Reality Systems" has been organized by STIIMA beneficiary. The event has been celebrated online due to traveling restrictions of COVID-19.

The event had the following parts:

- Participation in the 18th edition of **EuroXR 2021** conference (Milan- Online)
  - Organized by STIIMA as member of EuroXR Association member (not exclusive for DiManD researchers)
  - Website: https://www.euroxr-association.org/conference2021
  - 24 – 26 November 2021
- Sessions only for partners of the DiManD project
  - Technical sessions:
    - Session about "Introduction to VR applications "
      - Speaker: Dr. Marco Sacco (CNR-STIIMA)
    - Session about "Intelligent systems, cyber-physical systems and data mining"
      - Speaker: Dr. Gian Antonio Susto (U.Padova)
    - Session about "Human Factors in Interactive Systems"
      - Speaker: Dr. Ganix Lasa and Dra. Maitane Mazmela (MGEP)
    - Session about "Humans in the future of manufacturing"
      - Speaker: Instinct Laboratory
    - Session about "Practical "exercise" on augmented reality"
      - Speaker: Sara Arlati (STIIMA)

Section 2 presents the agenda of the school, section 3 presents the meeting tool, section 4 presents the attendance list, section 5 presents each of the sessions and finally section 6 presents the conclusions.

2 Agenda of the event

The agenda for the sessions for the DiManD Shool 4 is the following:

- Session about "Introduction to VR applications "
  - Speaker: Dr. Marco Sacco (CNR-STIIMA)
  - Date: 22nd November 2021, 10.00-12.00 (CET)
- 18th edition of EuroXR Conference:
  - Organized by CNR-STIIMA
  - Dates 24 – 26 November 2021
- Session about "Intelligent systems, cyber-physical systems and data mining"
  - Speaker: Dr. Gian Antonio Susto (U.Padova)
  - Date: 14th December 2021, 14.00-18.00 (CET)
- Session about "Human Factors in Interactive Systems"
  - Speaker: Dr. Ganix Lasa and Dra. Maitane Mazmela (MGEP)
  - Date: 17th December 2021, 8.30-12.30 (CET)
- Session about "Humans in the future of manufacturing"
  - Speaker: Instinct Laboratory
  - Date: 10th January 2022, 9.00-15.30 (CET)
- Session about "Practical "exercise" on augmented reality"
  - Speaker: Sara Arlati
  - Date: 11th January 2022, 9.30-17.30 (CET)

3 Meeting tool

Due to the traveling restrictions imposed by COVID-19, the School #4 has been held online. Zoom, Webex and Google Meet have been used for the sessions. Most of the sessions were recorded for those who could not attend the trainings. The recordings are available in the project repository and will also be published on the project's You Tube channel.

4 Attendants

This is the attendance list of people from Beneficiaries and partner organizations that attended the event. Training sessions were oriented to ESRs.

	Name	Organization	ESR	Comments (what sessions attended)
1	Fan Mo	UNOTT	ESR 1	All sessions
2	Agajan Torayeva	UNOTT	ESR 2	All sessions
3	Angela Carrera	MGEP	ESR 3	All sessions
4	Ngoc Hien Nguyen	MGEP	ESR 4	All sessions
5	Miriam Ugarte	MGEP	ESR 5	All sessions
6	Trunal Patil	STIIMA	ESR 6	All sessions
7	Jose A. Mulet Alberola	STIIMA	ESR 7	All sessions
8	Fabio Monetti	KTH	ESR 8	All sessions except the "Practical Exercise in AR" and "Human Factors at Industry 4.0"
9	Sylvia Nathaly Rea Minango	KTH	ESR 9	"Intelligent systems, cyber-physical systems and data mining" and "Introduction Session to Virtual Reality applications"
10	Luis Estrada	UNINOVA	ESR 10	All sessions
11	Terrin Babu Pulikottil	UNINOVA	ESR 11	All sessions except "Human factors at Industry 4.0"
12	Muhammad Bilal Khan	TECNALIA	ESR 12	All sessions except "Human factors at Industry 4.0"
13	Hamood Ur Rehman	TQC	ESR 14	All sessions
14	Jack Chaplin	UNOTT (beneficiary)		Instinct Lab
15	Felix Larrinaga	MGEP (beneficiary)		"Intelligent systems, cyber-physical systems and data mining", "Introduction Session to Virtual Reality applications", "Practical "exercise" on augmented reality (partially)"
16	Miren Illarramendi	MGEP (beneficiary)		EUXR conference, "Practical "exercise" on augmented reality (partially)", "Human factors at Industry 4.0 (partially)"
17	Ganix Lasa	MGEP (beneficiary)		Human factors at Industry 4.0
18	Marco Sacco	STIIMA (beneficiary)		EUXR conference, "Introduction Session to Virtual Reality applications"
18	Sara Arlati	STIIMA (beneficiary)		EUXR conference , "Practical "exercise" on augmented reality "

5   Sessions

In this section each of the sessions is briefly explained.

5.1   Sessions of the 18th edition of EuroXR Conference

Figure 1: Agenda of the 18th edition of the EuroXR Conference: Day 1

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DAY 1   Wednesday, November 24
08.25 h          Greetings from web moderator
08.30 h          EuroXR EC meeting
chair: Marco Sacco
09.45 h          Break
09.55 h          Greetings from web moderator
10.00 h          Opening session
chairs: Luca Greci, Torsten W. Kuhlen, and Patrick Bourdot
10.25 h          Greetings from web moderator
10.30 h          Application Keynote Speaker 1 — Christian Lunetta
chair: Luca Greci
11.30 h          Greetings from web moderator
11.35 h          Application session 1 — Society
chair: Sara Arlati
12.25 h          Break (lunch)
13.55 h          Greetings from moderator
14.00 h           Scientific Keynote Speaker 1: Pr. Christian Sandor
chair: Hideo Saito
15.00 h          Greetings from moderator
15.05 h          Scientific session 1 — Perception and Cognition
chair: Victoria Interrante
16.00 h          Break
16.10 h          Greetings from web moderator
16.15 h          Scientific session 2 — Interactive techniques
chair: Dirk Reiners
17.00 h          Greetings from web moderator
17.05 h          Scientific posters — Fast forward
chair: Dirk Reiners
17.20 h          Demos & Exhibitions — Fast forward chair: Matthieu Poyade
17.35 h          END of DAY 1
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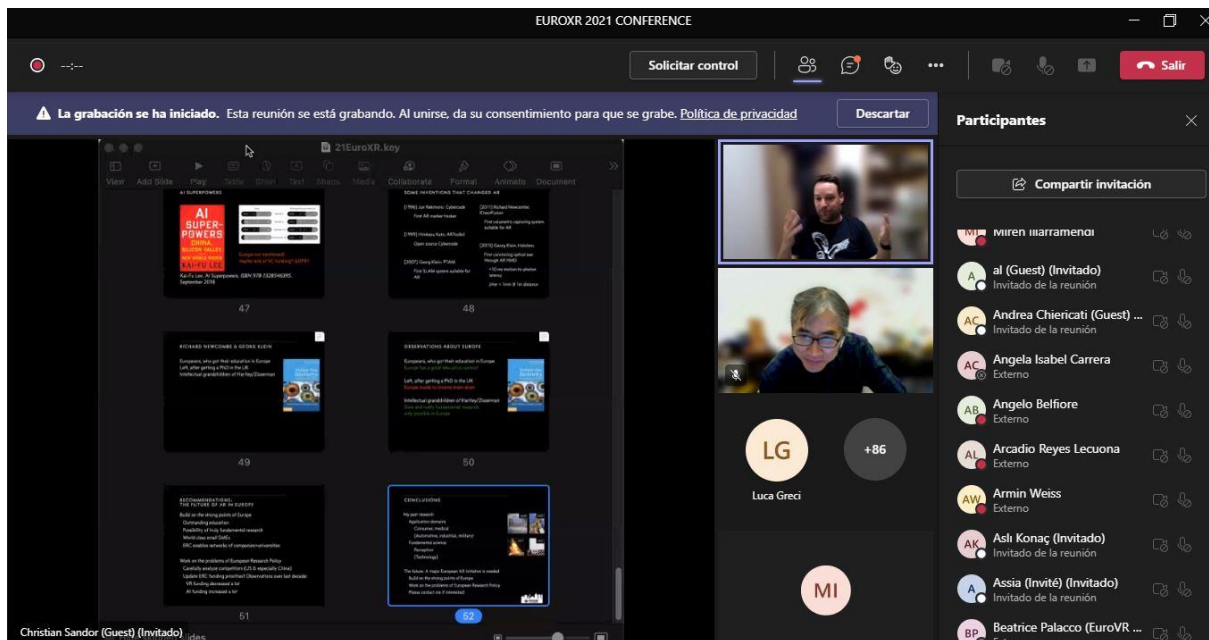

Figure 2: A screenshot of the "EuroXR conference" 1st Day session

Figure 3: Agenda of the 18th edition of the EuroXR Conference: Day 2

DAY 2 Thursday, November 25
08.25 h   Greetings from web moderator
08.30 h   XR Open Forum
chairs: Jérôme Perret, with the futur leader of this initiative
10.00 h   Break
10.10 h   Greetings from web moderator
10.15 h
VAMRS special session – chair: Carsten Domann
11.20 h   Greetings from web moderator
11.25 h   Demonstrations – Presentation session (in separate virtual rooms)
chair : Matthieu Poyade
12.30 h   Break (lunch)
13.55 h   Greetings from web moderator
14.00 h   Scientific Keynote Speaker 2: Pr. Marc Erich Latoschik
chair: Patrick Bourdot
15.00 h   Greetings from web moderator
15.05 h   Scientific session 3 – Tracking and Rendering
chair: Hideo Saito
16.10 h   Greetings from web moderator
16.15 h   Scientific posters – Presentation session (in separate virtual rooms)
chairs: Torsten W. Kuhlen
16.55 h   Greetings from web moderator
17.00 h   EuroXR General Assembly – chair: Marco Sacco
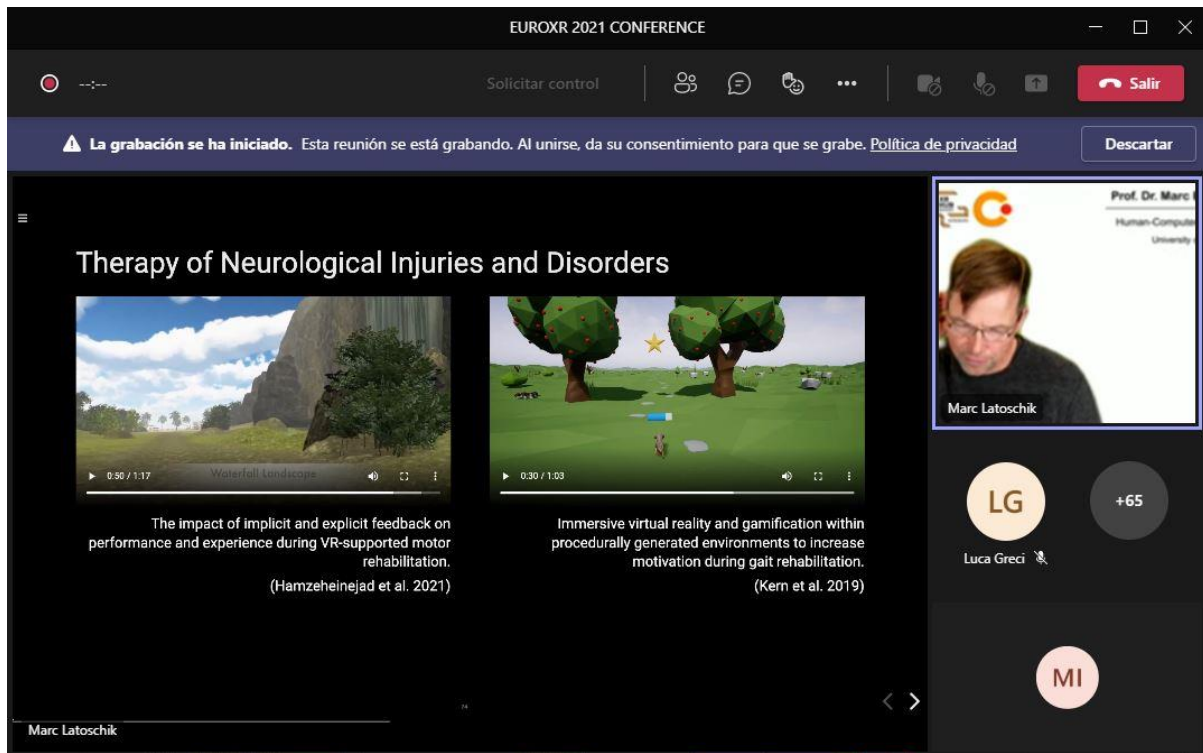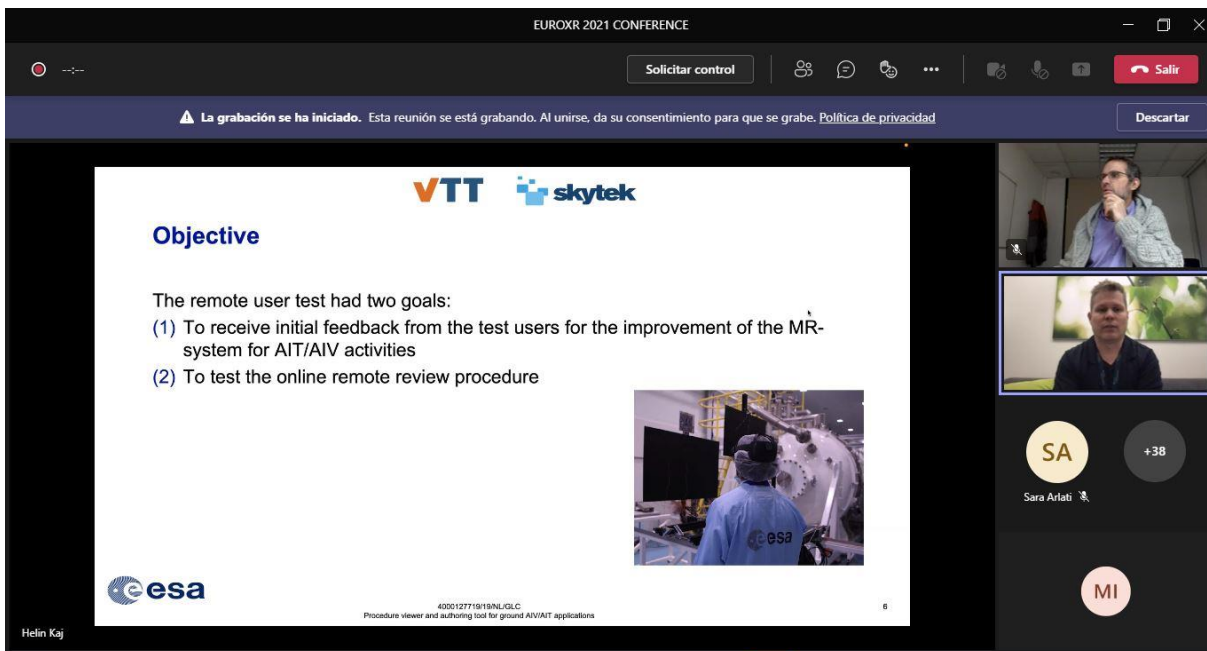18.10 h   End of DAY 2

Figure 4: A screenshot of the "EuroXR conference" 2nd Day session

Figure 5: Agenda of the 18th edition of the EuroXR Conference: Day 3

DAY 3 Friday, November 26
08.45 h   Greetings from web moderator
08.50 h   VR4REHAB & VR4LongCovid special session chair: Remco Hoogendijk
09.55 h   Greetings from web moderator
10.00 h   Application Keynote Speaker 2 – Dr. Walter Terkaj
chair: Lorenzo Cappannari
11.00 h   Break
11.10 h   Greetings from web moderator
11.15 h   Application session 2 – Industry
chair: Frédéric Noel
12.30 h   Break (lunch)
13.55 h   Greetings from web moderator
14.00 h   Scientific Keynote Speaker 3: Dr. Anne-Hélène Olivier
chair: Victoria Interrante
15.00 h   Greetings from web moderator
15.05 h   Scientific session 4 – Use case and User study
chair: Mariano Alcaniz Raya
16.10 h   Greetings from web moderator
16.15 h   Awards and closing ceremony
chairs: Luca Greci, Hideo Saito, and Patrick Bourdot
with the best awards committee chairs, and future General chair of EuroXR 2022
16.45 h   End of EuroXR 2021

Figure 6: A screenshot of the "EuroXR conference" 3rd Day session

5.2   Sessions only for partners of the DiManD project

5.2.1   Technical session: Session about Introduction to VR applications

<u>Speaker</u>: Marco Sacco (STIIMA)

<u>Duration</u>: 2 hours

<u>When</u>: 10:00-12:00 (CET), 22/11/2022

Session about Virtual Reality applications given by Marco Sacco from STIIMA. This session has been given as an introductory session to the EuroXR conference in order to explain the topic and also to show different industrial applications of this technology.
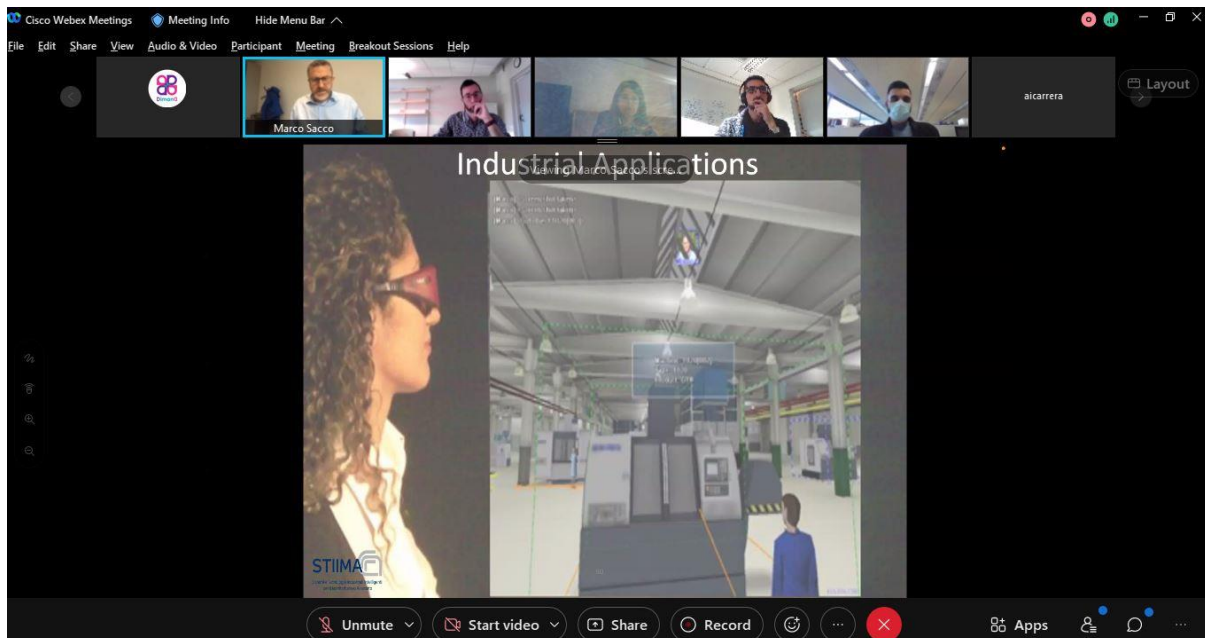

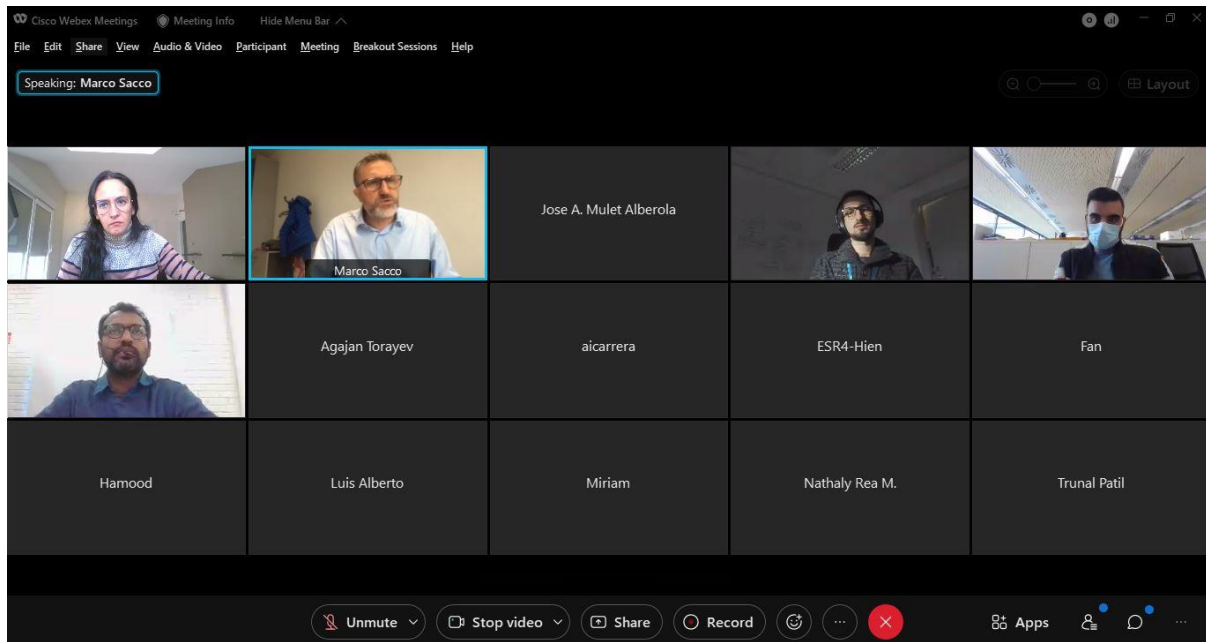*Figure 7: A screenshot of the "Introduction to VR applications" session*

Figure 8: A screenshot of the "Introduction to VR applications" session

5.2.2 Technical session: Session about Intelligent systems, cyber-physical systems and data mining

<u>Speaker</u>: Gian Antonio Susto (U. Padova)

<u>Duration</u>: 4 hours

<u>When</u>: 14:00-18:00 (CET), 14/12/2022

Session about Intelligent Systems, CPSs and Data mining given by Gian Antonio Susto from U.Padova. This session has been given as session to explain the topic and also to show different industrial applications of this technology.

#1 Without data, no ML

Machine Learning is not black magic, but it is a science based on the availability of data

Without data (or a data strategy) there is no way to implement a Machine Learning solution!

From the web

Figure 9: A screenshot of the "Intelligent systems, cyber-physical systems and data mining" session

#2 Some phenomena are 'unpredictable'

This AI Simulated the 2018 World Cup 100,000 Times to Predict a Winner

A group of researchers used AI and machine learning to predict that Spain and Germany are the most likely winners of the 2018 World Cup in Russia.

From the web

Group F [edit]
Main article: 2018 FIFA World Cup Group F

Pos	Team	[V · T · E]	Pld	W
1	🇸🇪 Sweden		3	2
2	🇲🇽 Mexico		3	2
3	🇰🇷 South Korea		3	1
4	🇩🇪 Germany		3	1

Wikipedia

Round of 16

Spain 🇪🇸	1–1 (a.e.t.)	🇷🇺 **Russia**
Ignashevich ⚽ 12' (o.g.)	Report	Dzyuba ⚽ 41' (pen.)
	Penalties	
Iniesta ✅	3–4	Smolov ✅
Piqué ✅		Ignashevich ✅
Koke ❌		Golovin ✅
Ramos ✅		Cheryshev ✅
Aspas ❌		

Wikipedia

Figure 10: A screenshot of the "Intelligent systems, cyber-physical systems and data mining" session

5.2.3 Technical session: Session about Human Factors in Interactive Systems

Speaker: Ganix Lasa & Maitane Mazmela (MGEP)

Duration: 4 hours

When: 9:00-12:00, 29/06/2021

Session about Human Factors in Interactive Systems given by Ganix Lasa and Maitane Mazmela from MGEP. This was the agenda of the training:

- Human Centered Industry (20 min)
- Operator 4.0 (10 min)
- Technology acceptance and human factors (80 min)
- Break (10 min)
- Tools for HF evaluation
- An overview (20 min)
- ITPX model (20 min)
- Case studies (20 min)
- Evaluating HF: exercise (30 min)
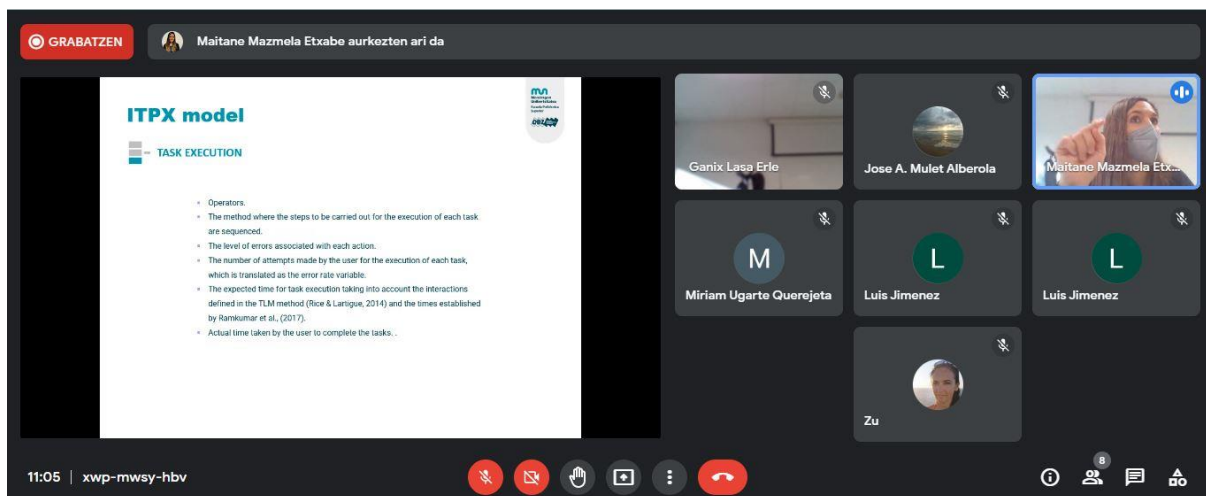- Conclusions and close (30 min)

Figure 11: A screenshot of the session about "Human Factors in Interactive Systems"

5.2.4 Technical Sessions: Session about Humans in the future of manufacturing

Speaker: Instinct Laboratory

Duration: 6 hours & 30 minutes

When: 9:00-15:30, 10/01/2022

Session about Humans in the future of manufacturing given by trainers from Instinct Laboratory. Instinct Laboratory is a unique business comprising of three distinct teams – research, behavioural sciences and creative design. This was the agenda for the training:

1. how humans "work"
    a. rational / emotional decision making
    b. learning
    c. intuition
    d. age effect on memory
2. user interfaces
    a. UI
    b. UX
    c. Ergonomics
3. human / machine relationships
4. perception of workspaces / environments / robots
    a. augmented reality
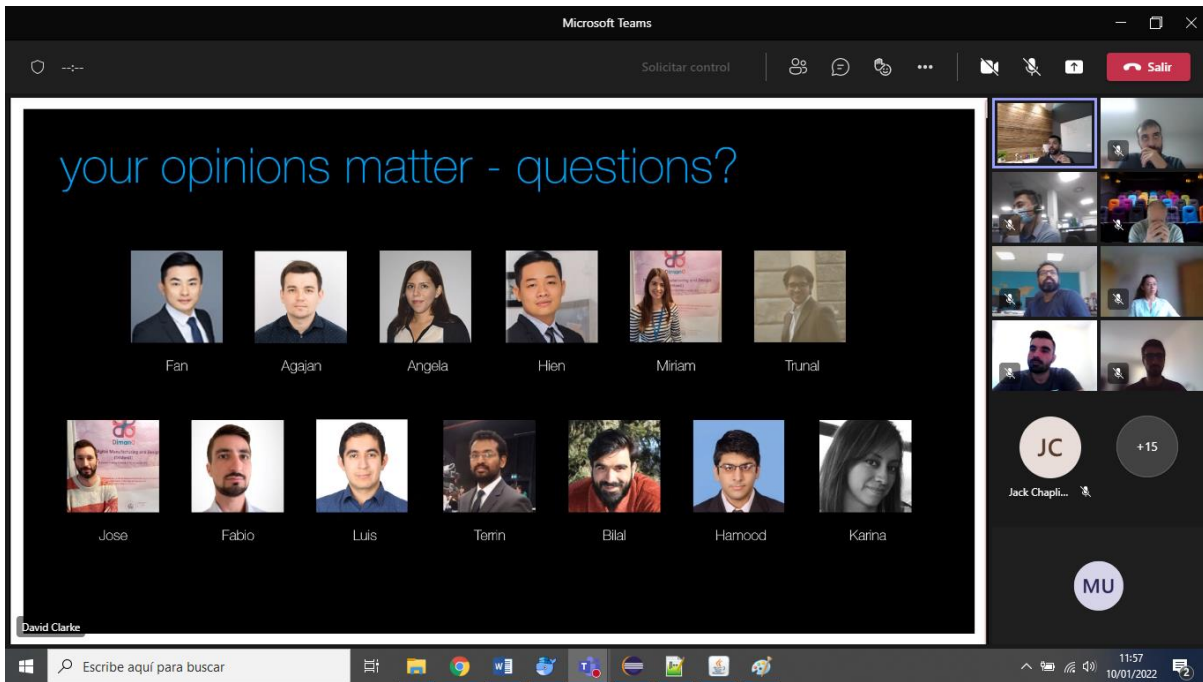   b. virtual reality
5. FA3D2 control centre design

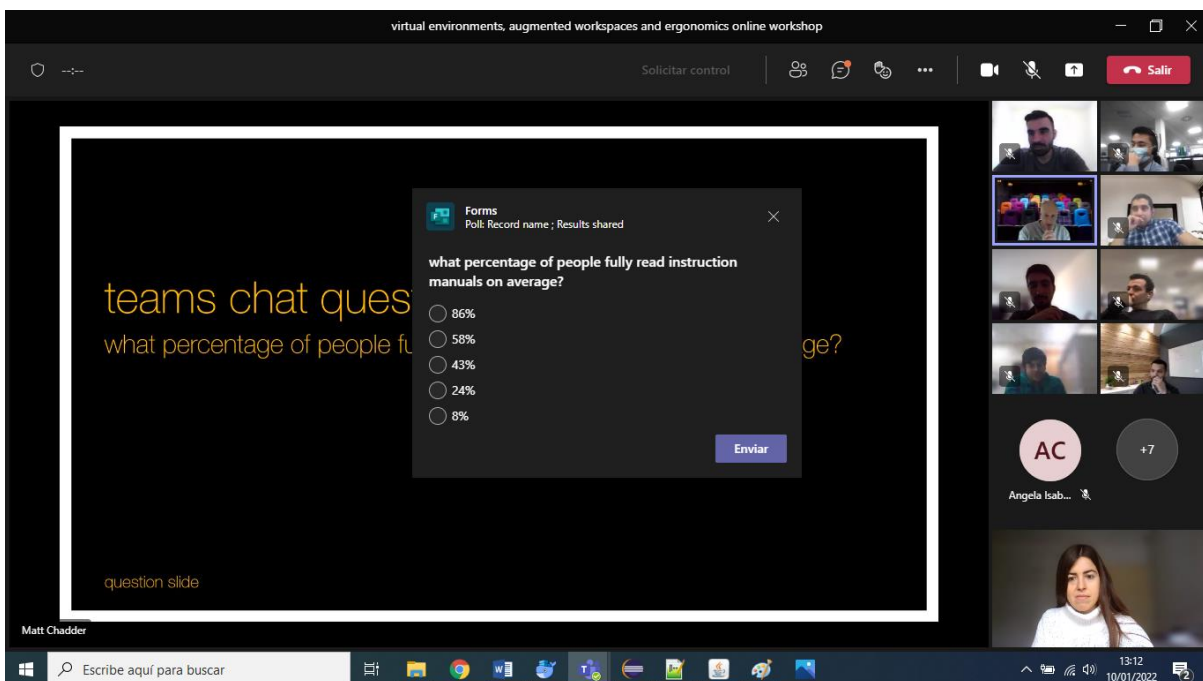*Figure 12: A screenshot of the session about "Human Factors in the future of Manufacturing"*

Figure 13: A screenshot of the session about "Human Factors in the future of Manufacturing"

5.2.5 Technical Sessions: Session about Practical exercise on augmented reality

Speaker: Sara Arlati

Duration: 8 hours

When: 9:30-17:30, 11/01/2022

Session about Practical exercise on augmented reality given by Sara Arlati from STIIMA. This was the agenda for the training:

- Morning Session:
  - Introductory lecture on the "Unity" software (Sara)
  - Software live demonstration (Sara)
- Afternoon Session:
  - Development of a small application (Practical exercise in groups)
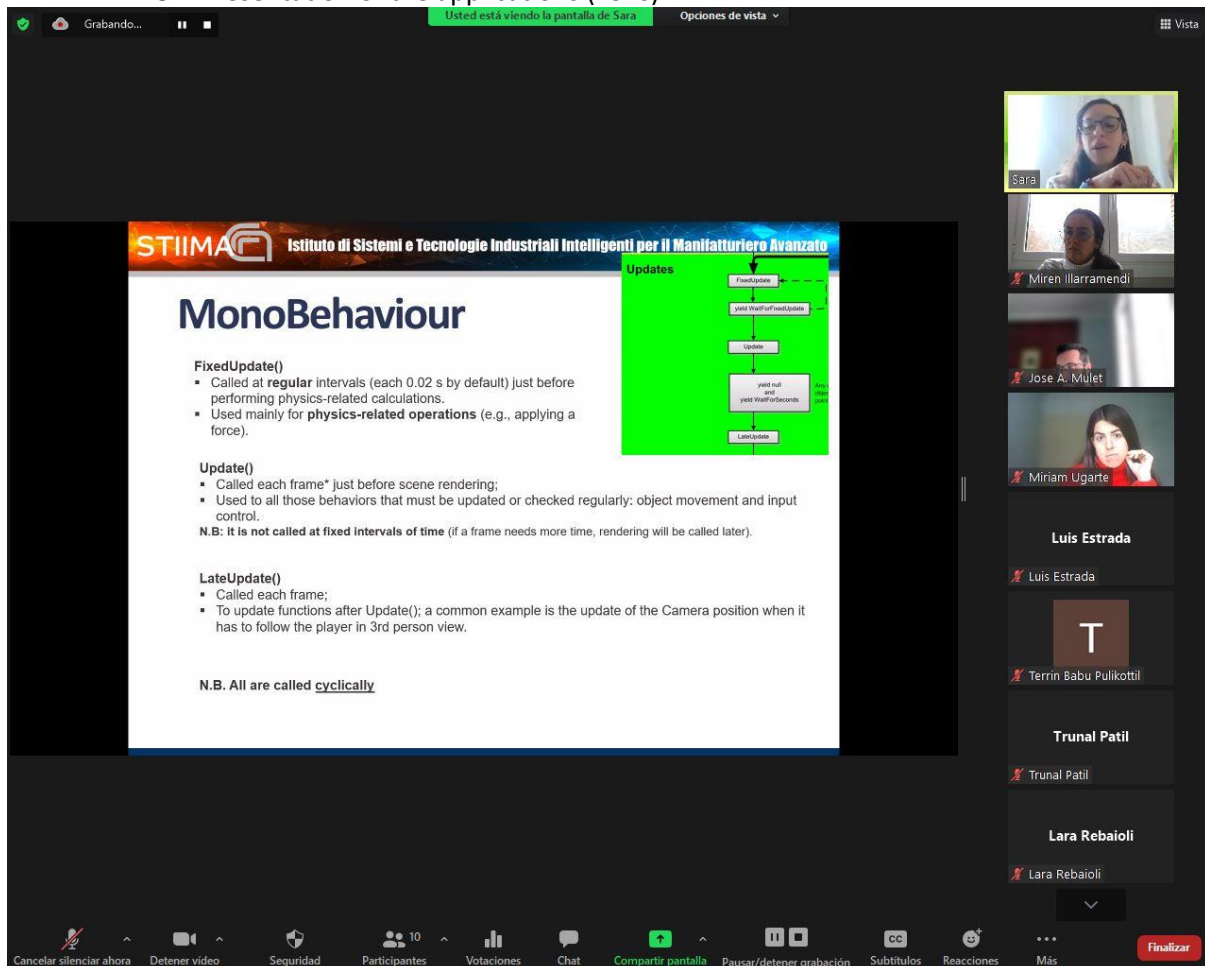 - Presentation of the applications (ESRs)

Figure 14: A screenshot of the session about "Practical Exercise on Augmented Reality"

Top left logo: DimanD

6 Conclusions

This deliverable presents the School #4 Event carried out during the months of November 2021 and January 2022. This event has been delayed to months M31-M33 due the impact of COVID-19. Although originally planned as a face-to-face event, it has been hold online due to current pandemic situation.

All fellows (13) have participated at least in a session and 9 of them have participated in all the sessions. Most of the sessions have been recorded and there will be available for the researchers to watch them again.

7 Versions

D2.5 School #4 event	
Version - Date	**Comments & Recommendations**
0.1 – 30/01/2022	First draft version
0.2 – XX/01/2022	Complete version
1.0 – 14/02/2022	Reviewed version for delivery