Гостьові лекції для здобувачів та викладачів факультету інформаційних технологій

05.12.2024

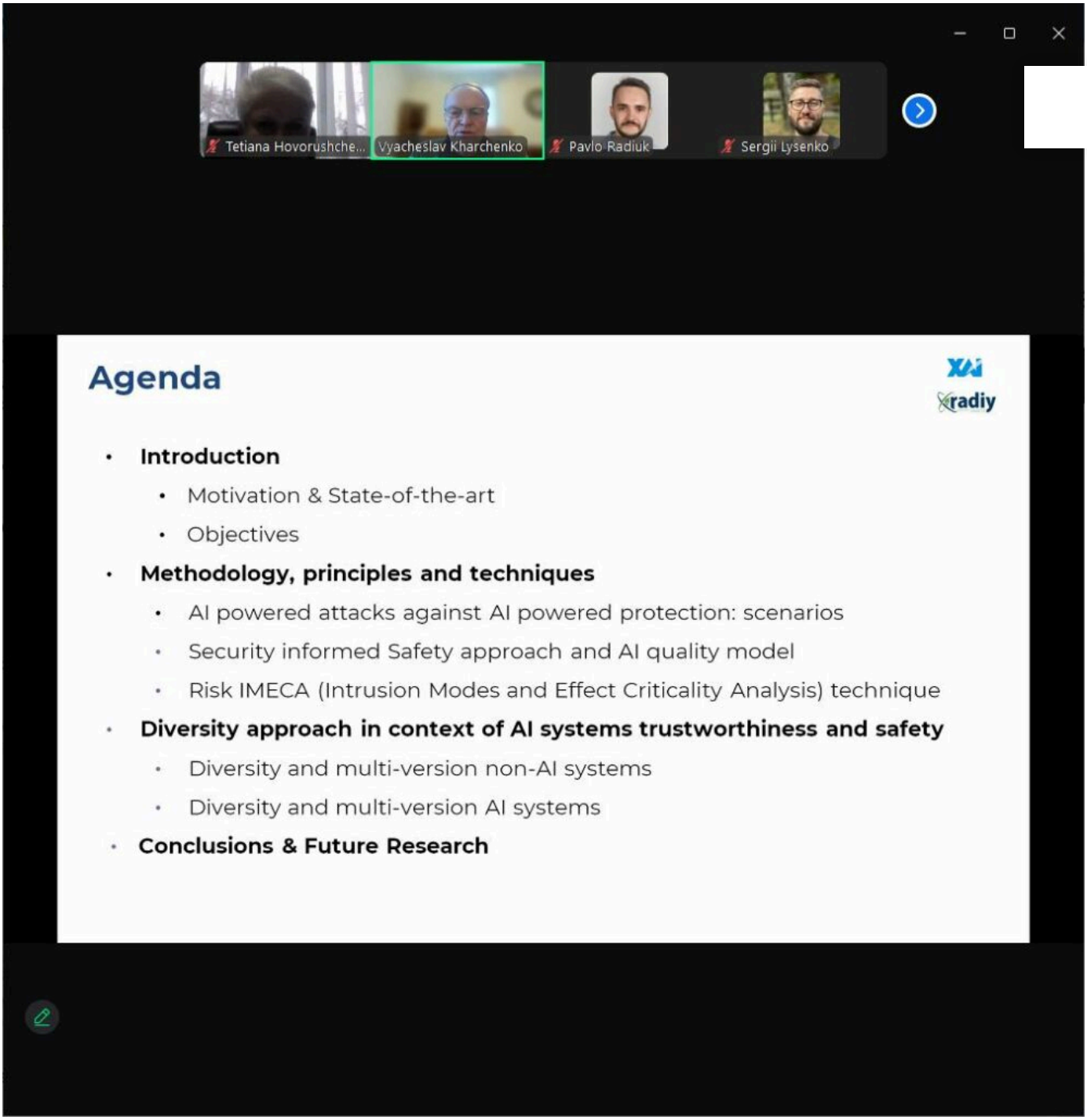
4 грудня 2024 року декан факультету інформаційних технологій Тетяна Говорущенко організувала онлайн-лекції для усіх бажаючих здобувачів освітніх програм факультету різних рівнів вищої освіти із запрошеними гостьовими спікерами. Долучались до лекцій також і зацікавлені викладачі факультету.

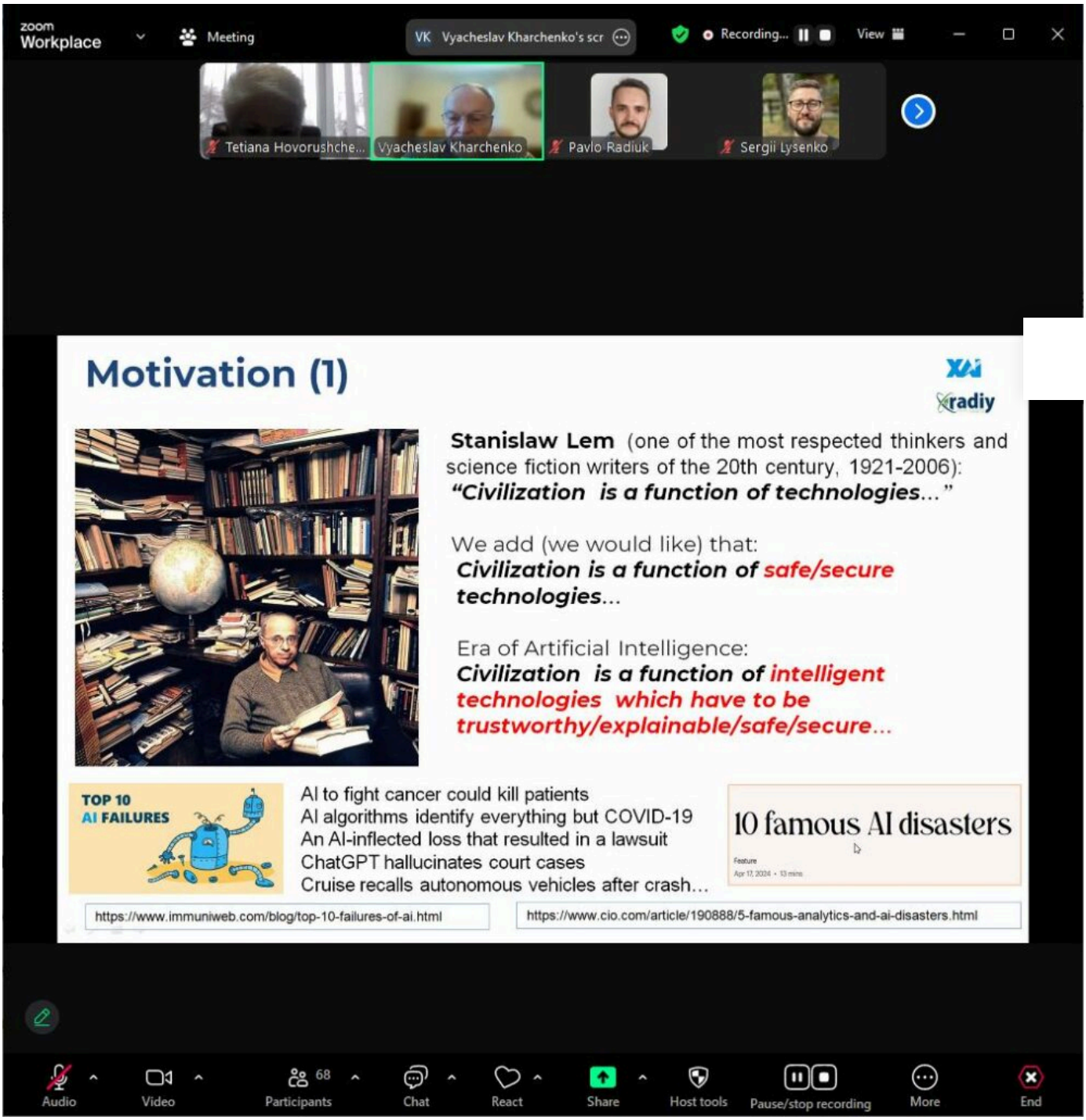
Гостьовими спікерами були:

– Вячеслав Харченко, д-р техн. наук, професор, заслужений винахідник України, лауреат Державної премії України у галузі науки і техніки, завідувач кафедри комп'ютерних систем, мереж і кібербезпеки Національного аерокосмічного університету «ХАІ», директор НТЦ аналізу та дослідження безпеки інфраструктур НВП «Радій», який розповів слухачам про виклики та рішення у сфері гарантоздатності та безпеки систем штучного інтелекту;

– Олена Голембовська, українська художниця, авторка наукових праць з інтеграції інформаційних технологій та сучасного мистецтва, картини якої виставлялися в Україні, Лондоні, в бойових частинах ЗСУ, яка розповіла слухачам про такі технології інтерактивного мистецтва, як доповнена реальність та штучний інтелект.

Щиро дякуємо нашим неперевершеним спікерам за цікаві та змістовні лекції!




zoom Workplace
Meeting
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Tetiana Hovorushche...
Vyacheslav Kharchenko
Pavlo Radiuk
Sergii Lysenko
Motivation (1)
xai radiy
Stanislaw Lem (one of the most respected thinkers and science fiction writers of the 20th century, 1921-2006):
"Civilization is a function of technologies..."
We add (we would like) that:
Civilization is a function of safe/secure technologies...
Era of Artificial Intelligence:
Civilization is a function of intelligent technologies which have to be trustworthy/explainable/safe/secure...
TOP 10 AI FAILURES
AI to fight cancer could kill patients
AI algorithms identify everything but COVID-19
An AI-inflected loss that resulted in a lawsuit
ChatGPT hallucinates court cases
Cruise recalls autonomous vehicles after crash...
10 famous AI disasters
https://www.immuniweb.com/blog/top-10-failures-of-ai.html
https://www.cio.com/article/190888/5-famous-analytics-and-ai-disasters.html
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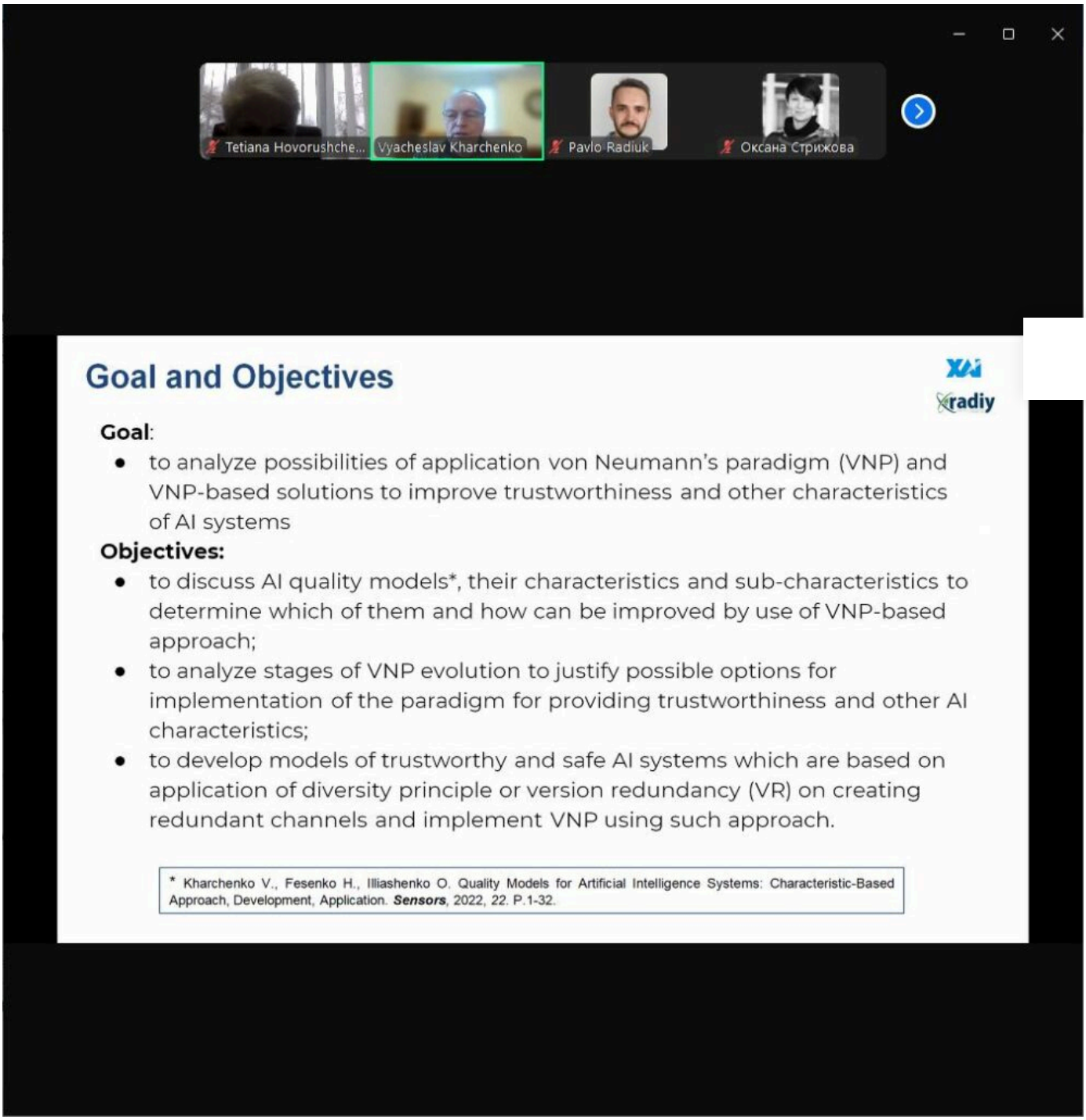
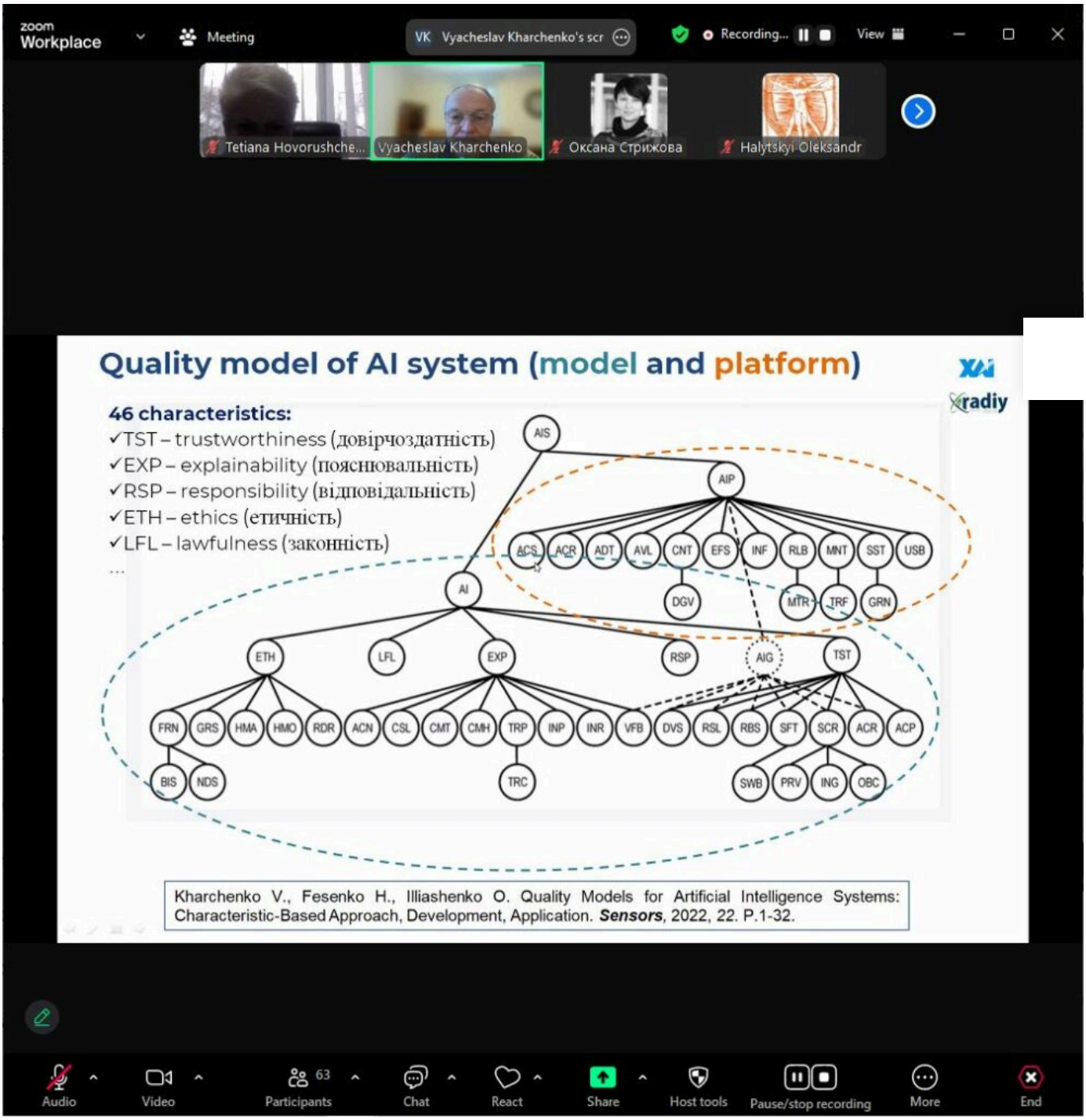

Tetiana Hovorushche...
Vyacheslav Kharchenko
Pavlo Radiuk
Оксана Стрижова
Goal and Objectives
radiy
Goal:
to analyze possibilities of application von Neumann's paradigm (VNP) and VNP-based solutions to improve trustworthiness and other characteristics of AI systems
Objectives:
to discuss AI quality models*, their characteristics and sub-characteristics to determine which of them and how can be improved by use of VNP-based approach;
to analyze stages of VNP evolution to justify possible options for implementation of the paradigm for providing trustworthiness and other AI characteristics;
to develop models of trustworthy and safe AI systems which are based on application of diversity principle or version redundancy (VR) on creating redundant channels and implement VNP using such approach.
* Kharchenko V., Fesenko H., Illiashenko O. Quality Models for Artificial Intelligence Systems: Characteristic-Based Approach, Development, Application. Sensors, 2022, 22. P.1-32.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Vyacheslav Kharchenko
Оксана Стрижова
Halytskyi Oleksandr
Quality model of AI system (model and platform)
xai
radiy
46 characteristics:
✓TST – trustworthiness (довірчоздатність)
✓EXP – explainability (пояснювальність)
✓RSP – responsibility (відповідальність)
✓ETH – ethics (етичність)
✓LFL – lawfulness (законність)
...
AIS
AIP
ACS
ACR
ADT
AVL
CNT
EFS
INF
RLB
MNT
SST
USB
AI
DGV
MTR
TRF
GRN
ETH
LFL
EXP
RSP
AIG
TST
FRN
GRS
HMA
HMO
RDR
ACN
CSL
CMT
CMH
TRP
INP
INR
VFB
DVS
RSL
RBS
SFT
SCR
ACR
ACP
BIS
NDS
TRC
SWB
PRV
ING
OBC
Kharchenko V., Fesenko H., Illiashenko O. Quality Models for Artificial Intelligence Systems: Characteristic-Based Approach, Development, Application. Sensors, 2022, 22. P.1-32.
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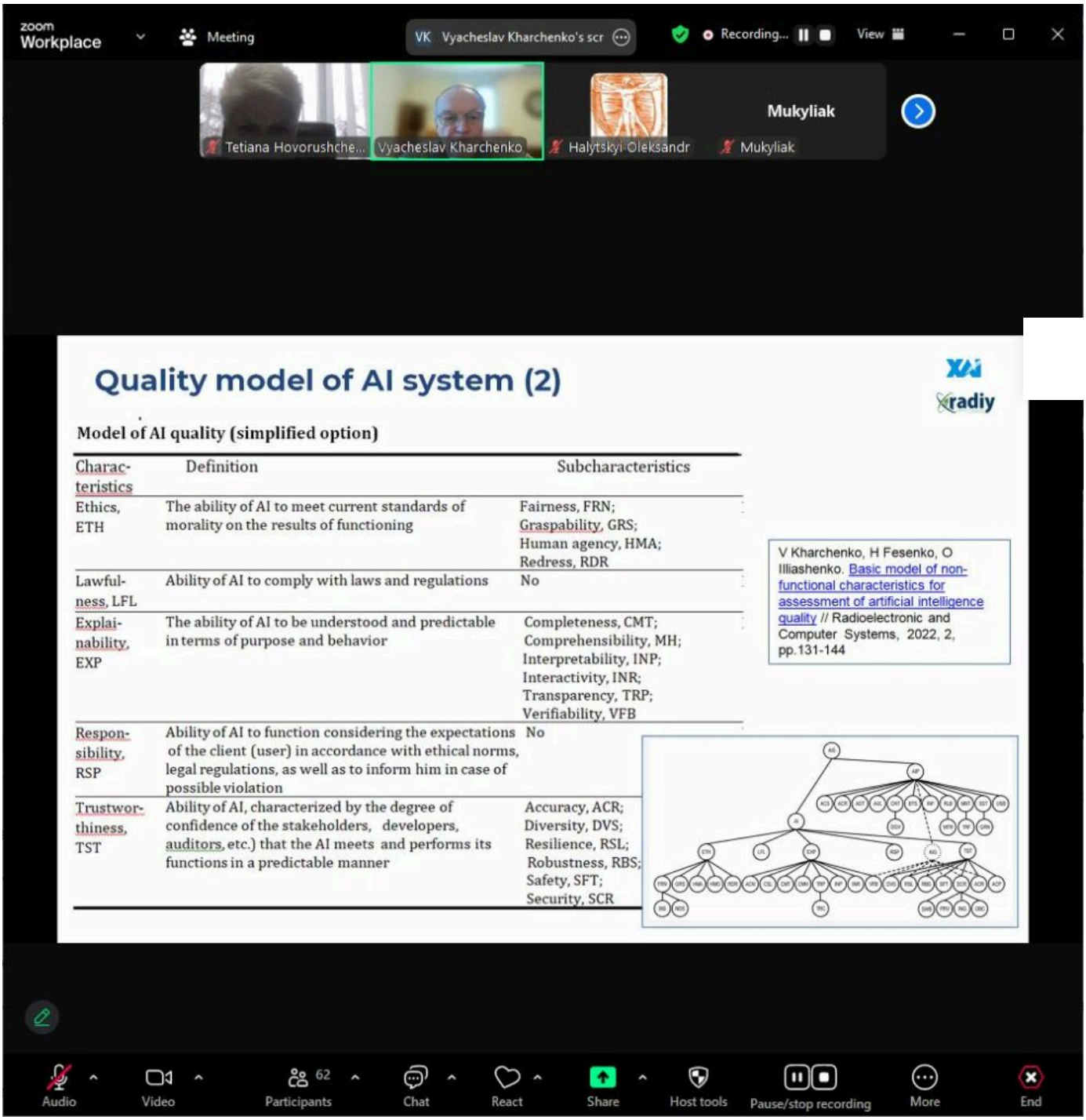
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Vyacheslav Kharchenko
Halytskyi Oleksandr
Mukyliak
Mukyliak
Quality model of AI system (2)
Model of AI quality (simplified option)
Charac-teristics
Definition
Subcharacteristics
Ethics, ETH
The ability of AI to meet current standards of morality on the results of functioning
Fairness, FRN; Graspability, GRS; Human agency, HMA; Redress, RDR
Lawful-ness, LFL
Ability of AI to comply with laws and regulations
No
Explai-nability, EXP
The ability of AI to be understood and predictable in terms of purpose and behavior
Completeness, CMT; Comprehensibility, MH; Interpretability, INP; Interactivity, INR; Transparency, TRP; Verifiability, VFB
Respon-sibility, RSP
Ability of AI to function considering the expectations of the client (user) in accordance with ethical norms, legal regulations, as well as to inform him in case of possible violation
No
Trustwor-thiness, TST
Ability of AI, characterized by the degree of confidence of the stakeholders, developers, auditors, etc.) that the AI meets and performs its functions in a predictable manner
Accuracy, ACR; Diversity, DVS; Resilience, RSL; Robustness, RBS; Safety, SFT; Security, SCR
V Kharchenko, H Fesenko, O Illiashenko. Basic model of non-functional characteristics for assessment of artificial intelligence quality // Radioelectronic and Computer Systems, 2022, 2, pp.131-144
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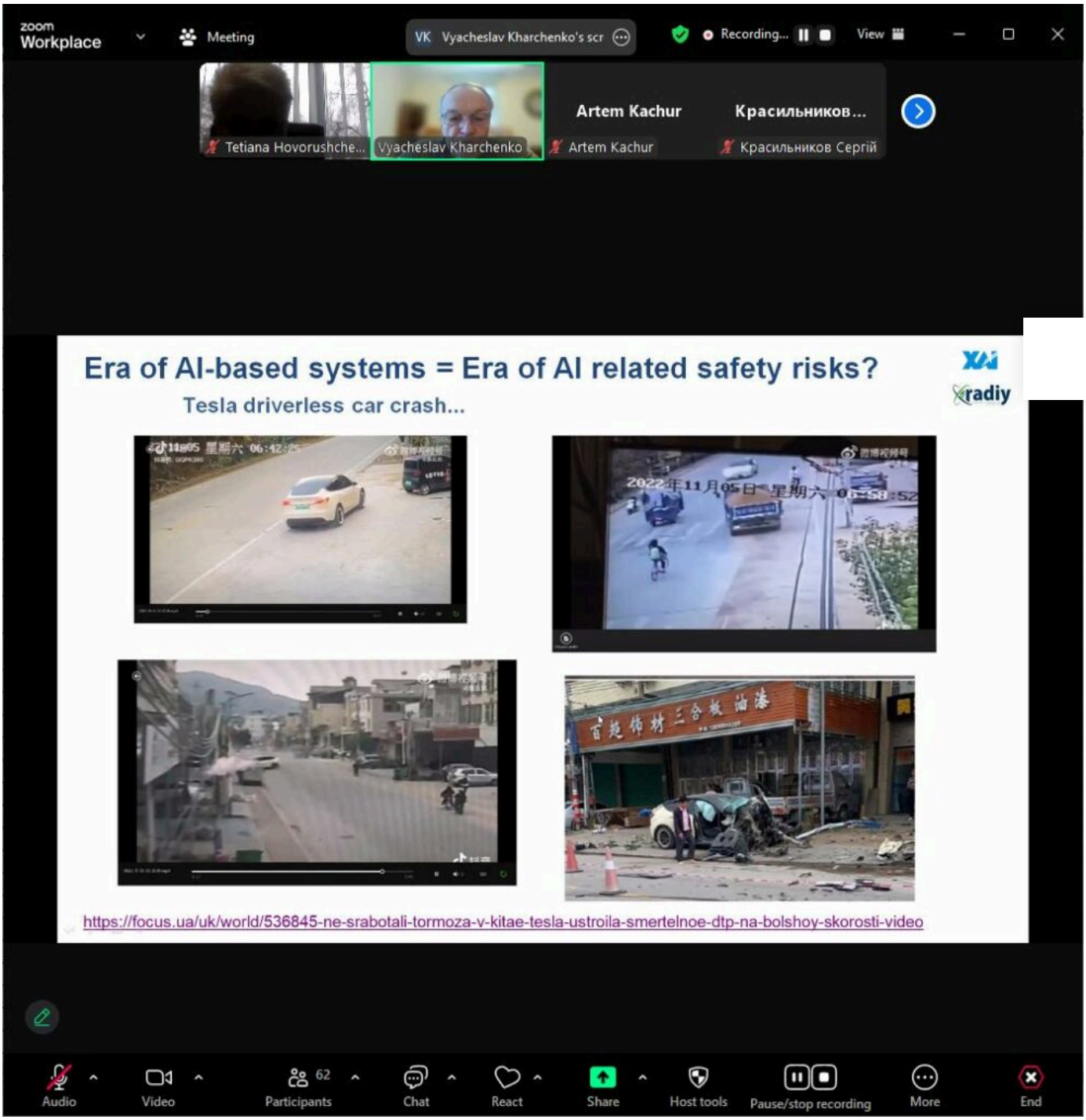
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Vyacheslav Kharchenko
Artem Kachur
Красильников...
Artem Kachur
Красильников Сергій
Era of AI-based systems = Era of AI related safety risks?
Tesla driverless car crash...
https://focus.ua/uk/world/536845-ne-srabotali-tormoza-v-kitae-tesla-ustroila-smertelnoe-dtp-na-bolshoy-skorosti-video
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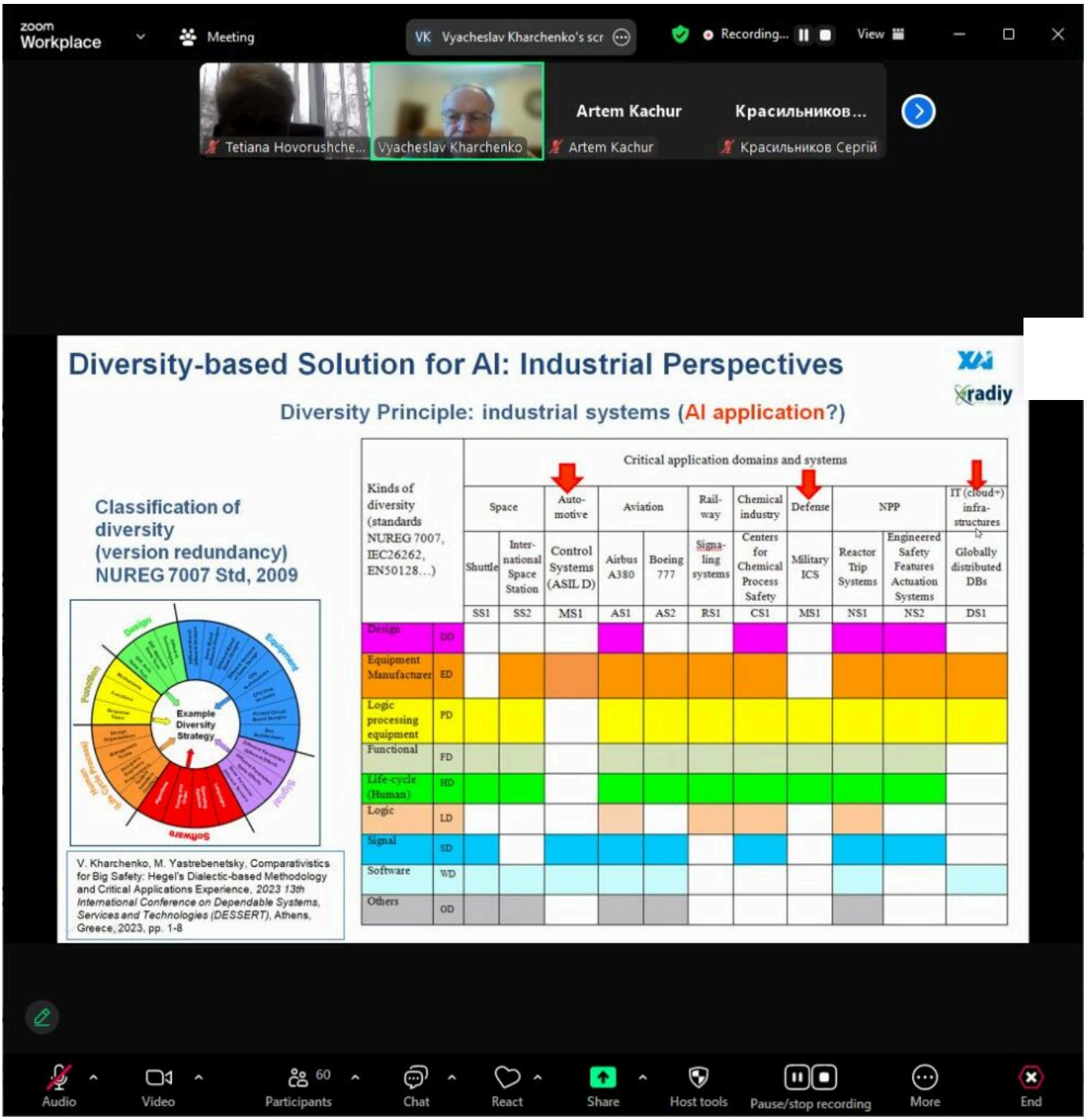
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Vyacheslav Kharchenko
Artem Kachur
Красильников...
Artem Kachur
Красильников Сергій
Diversity-based Solution for AI: Industrial Perspectives
Diversity Principle: industrial systems (AI application?)
Classification of diversity (version redundancy) NUREG 7007 Std, 2009
Example Diversity Strategy
Design
Equipment
Function
Signal
Software
Life Cycle Process
Human
V. Kharchenko, M. Yastrebenetsky, Comparativistics for Big Safety: Hegel's Dialectic-based Methodology and Critical Applications Experience, 2023 13th International Conference on Dependable Systems, Services and Technologies (DESSERT), Athens, Greece, 2023, pp. 1-8
Kinds of diversity (standards NUREG 7007, IEC26262, EN50128…)
Critical application domains and systems
Space
Auto-motive
Aviation
Rail-way
Chemical industry
Defense
NPP
IT (cloud+) infra-structures
Shuttle
International Space Station
Control Systems (ASIL D)
Airbus A380
Boeing 777
Signa-ling systems
Centers for Chemical Process Safety
Military ICS
Reactor Trip Systems
Engineered Safety Features Actuation Systems
Globally distributed DBs
SS1 SS2 MS1 AS1 AS2 RS1 CS1 MS1 NS1 NS2 DS1
Design DD
Equipment Manufacturer ED
Logic processing equipment PD
Functional FD
Life-cycle (Human) HD
Logic LD
Signal SD
Software WD
Others OD
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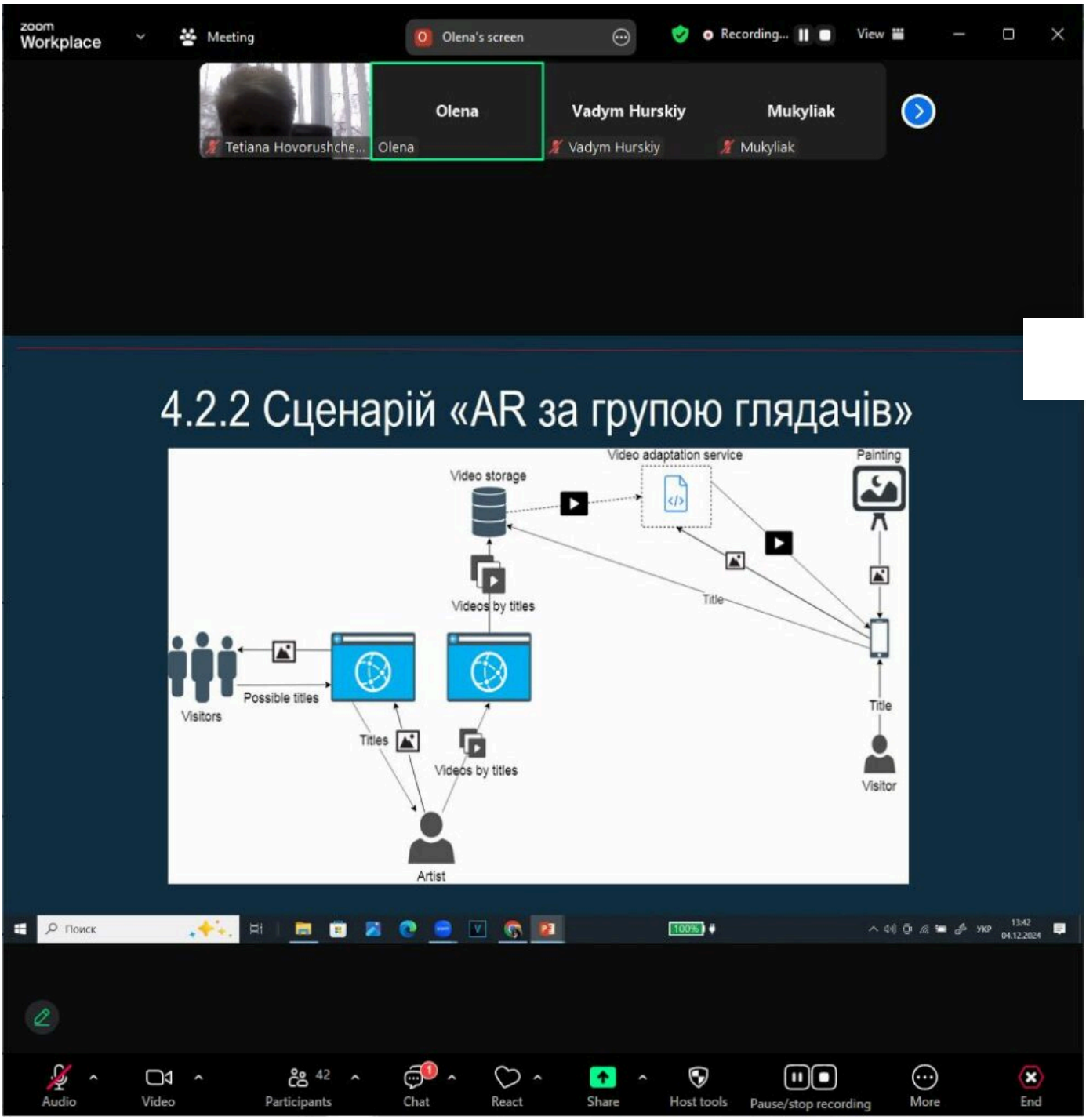
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Meeting
Olena's screen
Recording...
View
Olena
Vadym Hurskiy
Mukyliak
Tetiana Hovorushche...
Olena
Vadym Hurskiy
Mukyliak
4.2.2 Сценарій «AR за групою глядачів»
Video storage
Video adaptation service
Painting
Videos by titles
Title
Visitors
Possible titles
Titles
Videos by titles
Title
Visitor
Artist
Audio
Video
Participants
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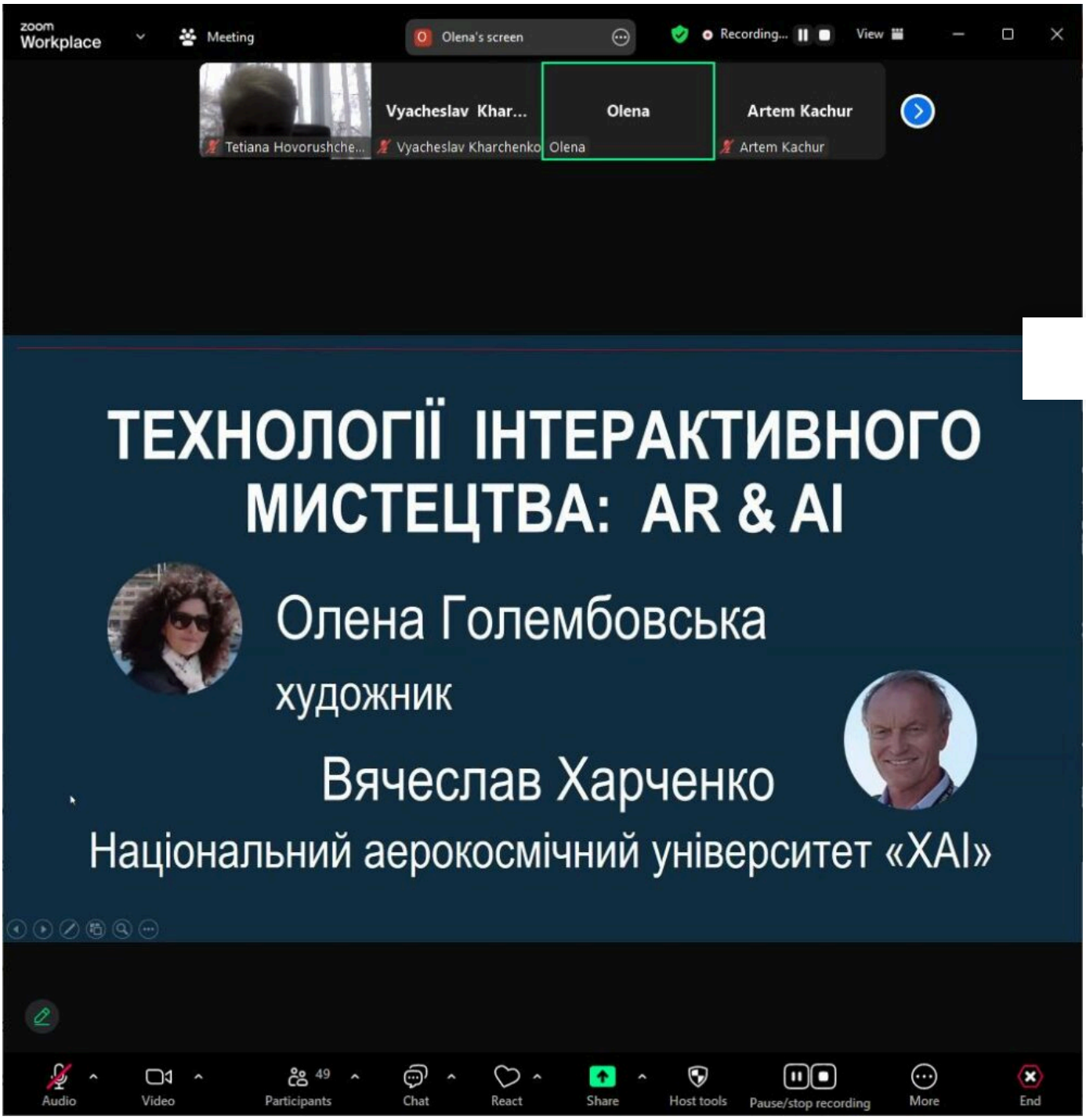

Інформація факультету інформаційних технологій

Центр кар’єри

Скринька довіри

Цивільний захист

Пожежна безпека

Охорона праці