HEIDELBERG LAUREATE FORUM

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY Dharwad ज्ञानेन विकासः

acm India Council

Pingala Interactions In Computing

Ubiquitous Computing

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The Alan Turing Institute

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Ubiquitous Computing

1. **Edge Computing**
2. **Cloudlet**
3. **Fog computing**
4. **Internet of Things (IoT)**
5. **Virtual Conferencing**
6. **Virtual Events (3D, and Hybrid)**

Ubiquitous computing

- Mark Weiser: Three basic ubiquitous computing devices:
  - Tabs: a wearable device that is approx in centimeters
  - Pads: a hand-held device that is approximately a decimeter in size
  - Boards: an interactive larger display device that is approximately a meter in size
- computing is made to appear anytime and everywhere
- any device, in any location, and in any format

Weiser, Mark. "The computer for the 21st century." *ACM SIGMOBILE mobile computing and communications review* 3.3 (1999): 3-11.
https://en.wikipedia.org/wiki/Ubiquitous_computing

Edge computing

- Distributed computing paradigm
- Computation and data storage closer to the user location
- Improve response times and save bandwidth
- Cloud computing operates on big data, whereas Edge computing operates on "instant data"
- Content Delivery Network or Content Distribution Network (CDN) (Refer to Unit 4)
- Akamai CDN (Refer to Unit 4)
- Akamai-Facebook's Photo-Serving Stack (Refer to Unit 4)

https://en.wikipedia.org/wiki/Edge_computing

Cloudlet

- First coined by Mahadev Satyanarayanan (Satya), Victor Bahl, Ramón Cáceres, and Nigel Davie
- It is a mobility-enhanced small-scale cloud datacenter that is located at the edge of the Internet.
- It work as a *data center in a box* which *brings the cloud closer.*
- Support resource-intensive and interactive mobile applications by providing powerful computing resources to mobile devices with lower latency.

https://en.wikipedia.org/wiki/Cloudlet

Fog computing

- Architecture that distributes computing, storage, control and networking functions closer to the users along a cloud-to-thing.
- Fog computing is often erroneously called edge computing, but there are key differences.
- Fog works with the cloud, whereas edge is defined by the exclusion of cloud.
- Fog is hierarchical where edge tends to be limited to a small number of layers.
- Cloud computing deal with Big Data, whereas Fog computing deals with real-time data generated by sensors or users.

[1] IEEE Standard Association. "IEEE 1934-2018-IEEE Standard for adoption of OpenFog reference architecture for fog computing." (2018).
https://en.wikipedia.org/wiki/Fog_computing

Internet of Things (IoT)

- The network of physical objects —"things"— embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the Internet.
- Example:
  - "Smart Home" devices and appliances,
  - "Smart city" equipment and facilities,
- Real-Time Data Analytics
- *Information explosion* or *Data Deluge*
  - due to *data flood* or *information flood*
  - ever-increasing amount of electronic data exchanged per time unit
  - unmanageable amounts of data growth V/S power of data processing

https://en.wikipedia.org/wiki/Internet_of_things

Virtual Conferencing

- Teleconference: Phone lines, Landlines or Cellular devices
- Video conference:
  - Webcam, Microphone, Speaker, Internet
  - hardware, software, devices is dedicated for this
- Web Conference: Internet and Cloud supported
  - Web 2.0
  - Well-Known: Google Meet, Skype, and Microsoft Team
  - Multi-Communications from Many sender to Many receivers
  - Webinars ("web seminars"), Webcasts (live media presentation), Podcast (audio presentation), and web meetings
  - **Virtual Events**

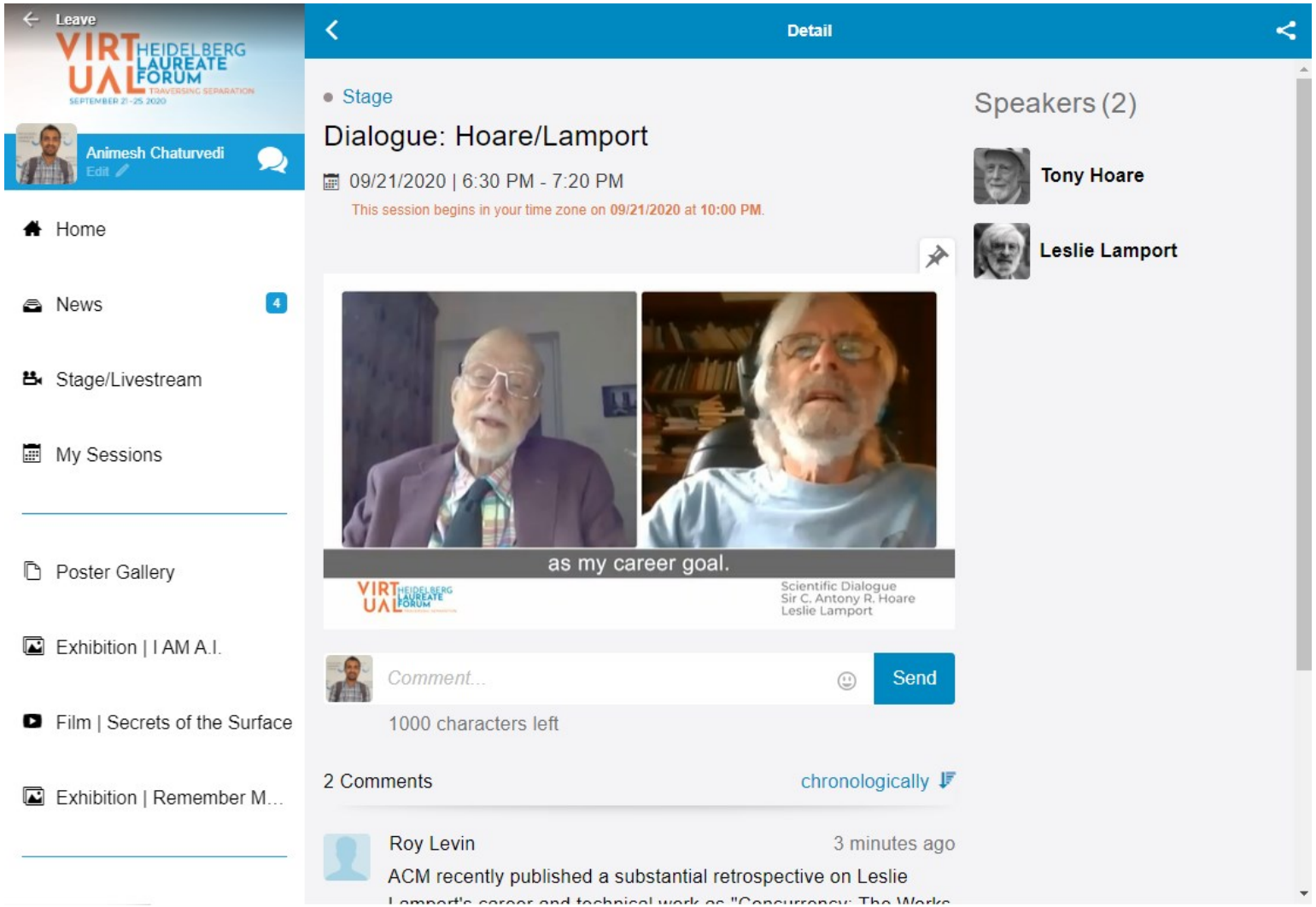
https://en.wikipedia.org/wiki/Internet_of_things

Virtual Events

- An online event involves people interacting in a virtual environment on the web, instead of physical meeting.
- Multi-session online events often feature webinars and webcasts.
- Aim to create similar experience as physical meeting.
- Live-streaming the event online or on-demand video.
- Issues
  - Echo of voice
  - Audio and Videography logistics
  - Network Bandwidth of conferencing server and users

https://en.wikipedia.org/wiki/Virtual_event

2D Virtual Event: Live Streaming



[Virtual HLF 2020 - Heidelberg Laureate Forum]

3D Virtual Event: Live Video

[Virtual HLF 2020 - Heidelberg Laureate Forum]

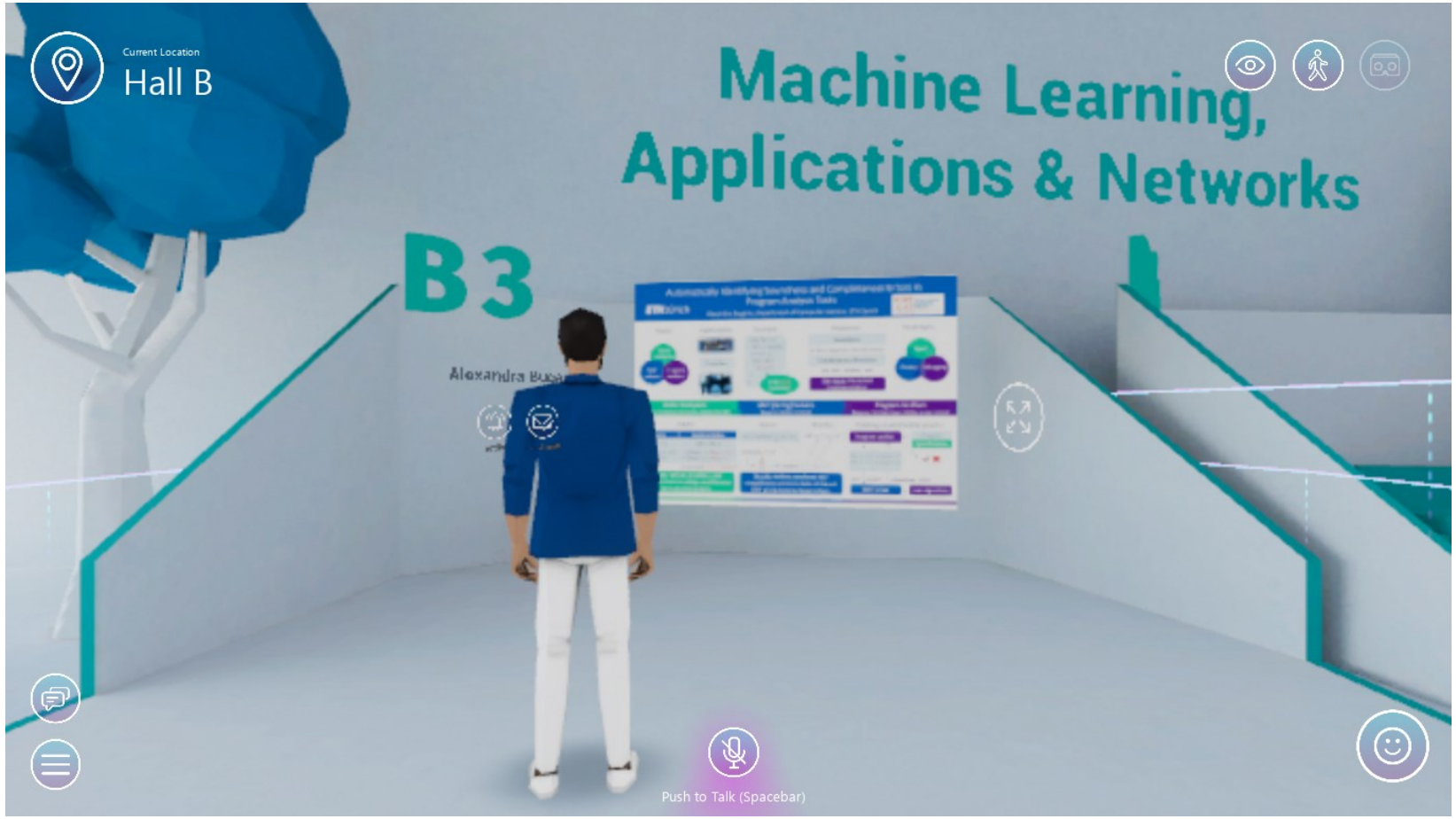
3D Virtual Event:

[Virtual HLF 2020 - Heidelberg Laureate Forum]

3D Virtual Event: Poster Sessions

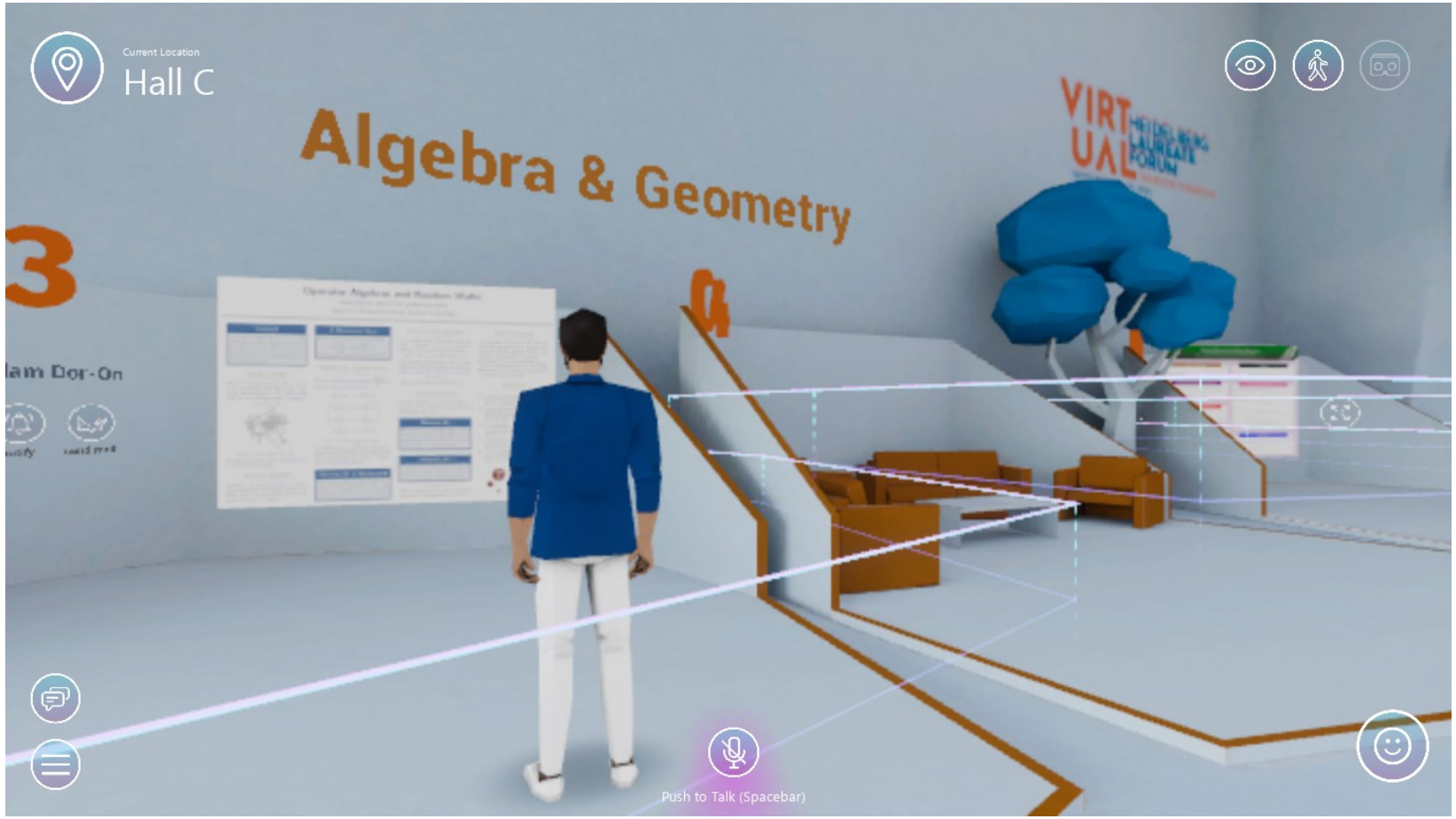
[Virtual HLF 2020 - Heidelberg Laureate Forum]

3D Virtual Event: Poster Sessions



[Virtual HLF 2020 - Heidelberg Laureate Forum]

3D Virtual Event: Poster Sessions



[Virtual HLF 2020 - Heidelberg Laureate Forum]

3D Virtual Event: Poster Sessions

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3D Virtual Event: Virtual Gathering

Virtual HLF 2020 - Heidelberg Laureate Forum

3D Virtual Event: Recreations

Virtual HLF 2020 - Heidelberg Laureate Forum

3D Virtual Event: Virtual Dancing

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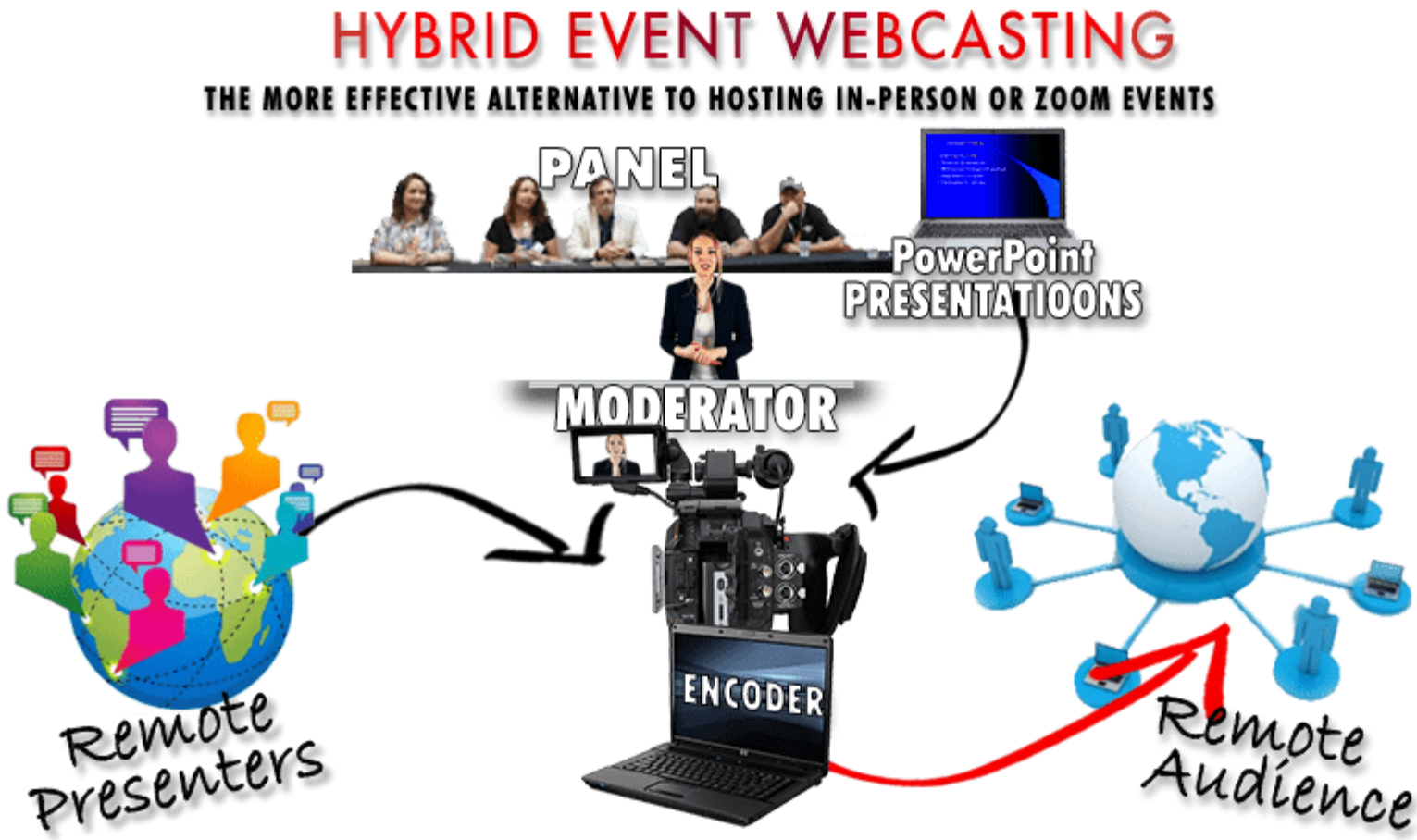
Hybrid Event

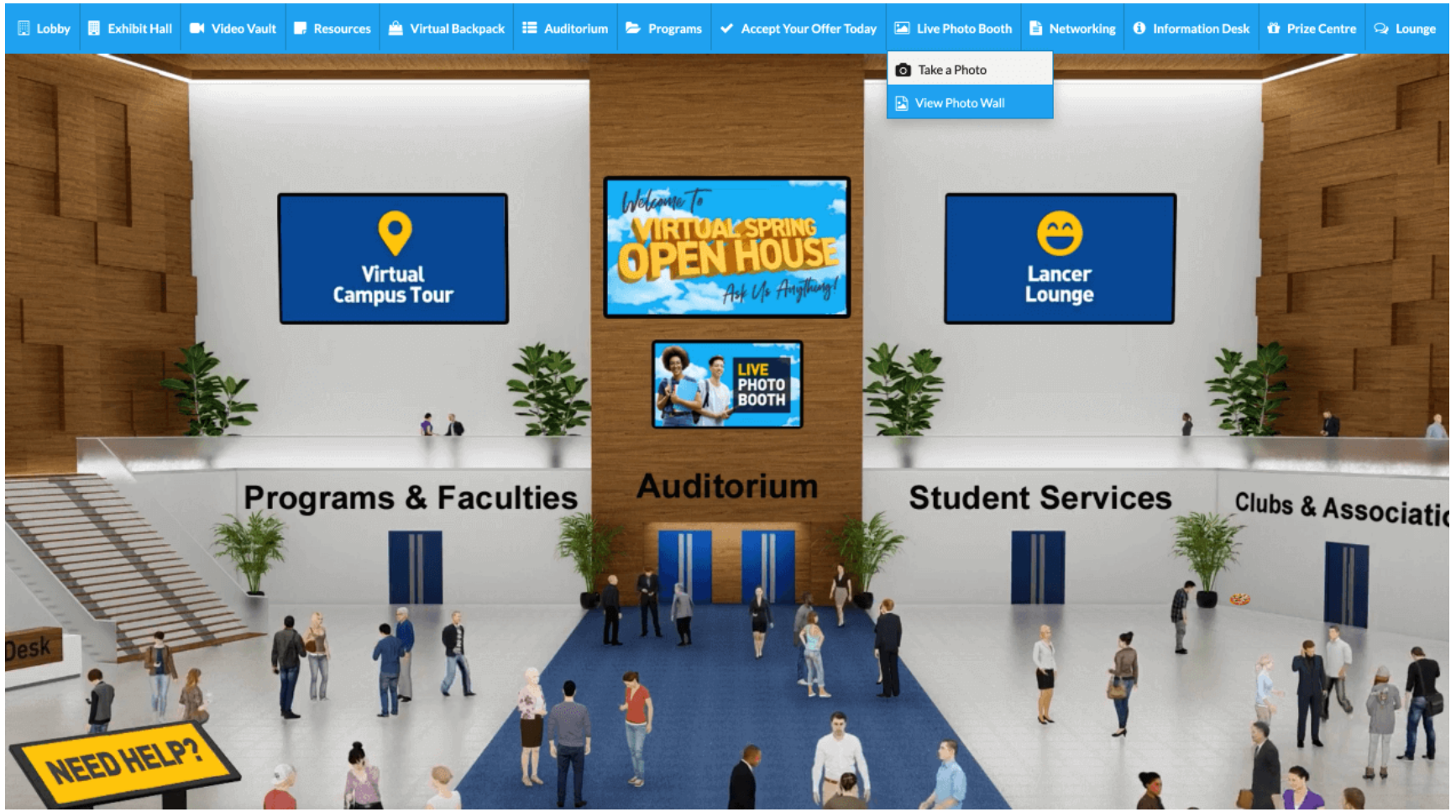
- Combines a “physical" in-person event with a "virtual" online component
- Tradeshow, Conference, Seminar, Workshop, Convocation



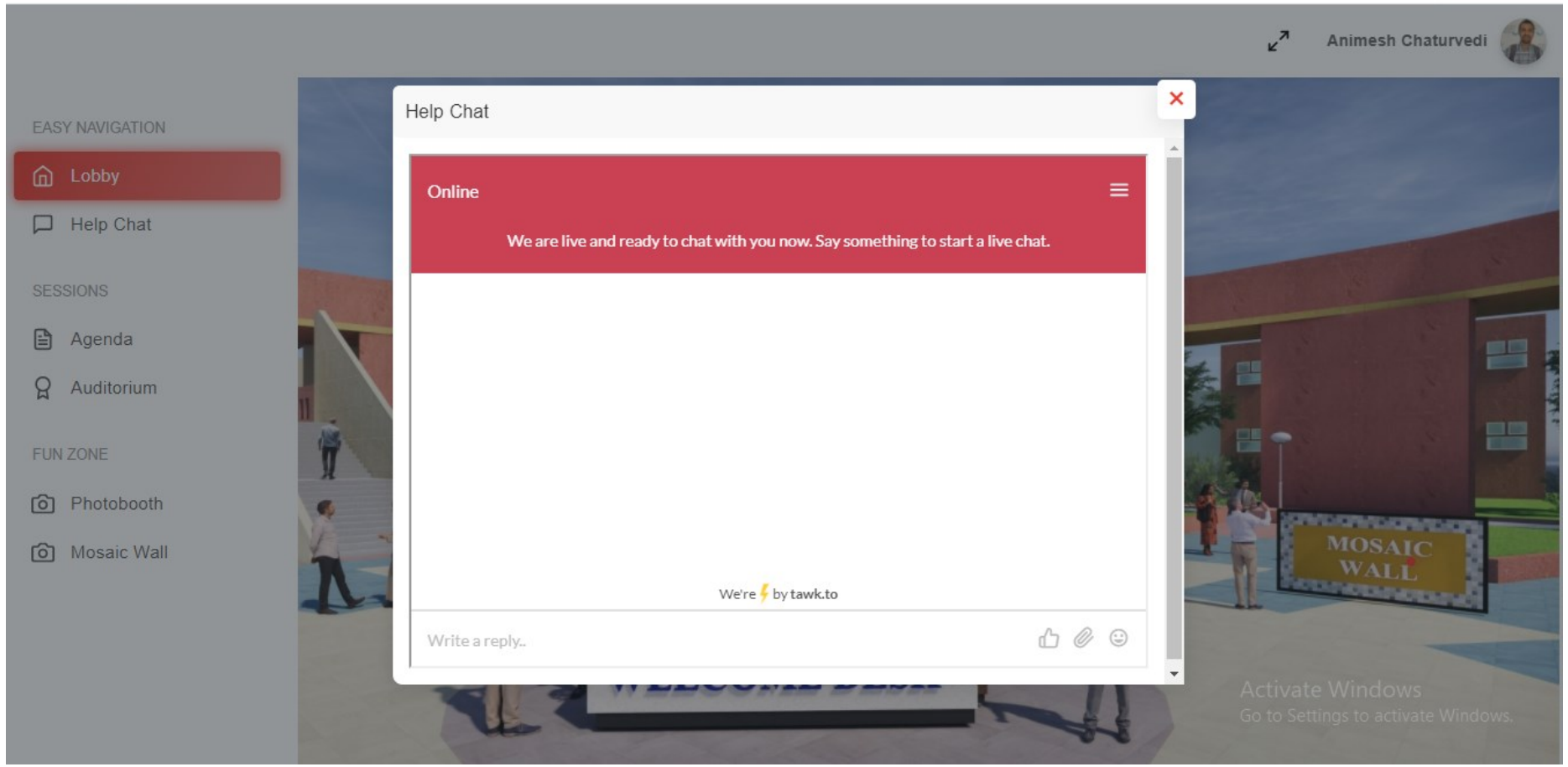
https://en.wikipedia.org/wiki/Hybrid_event

Hybrid Event: Landing Page

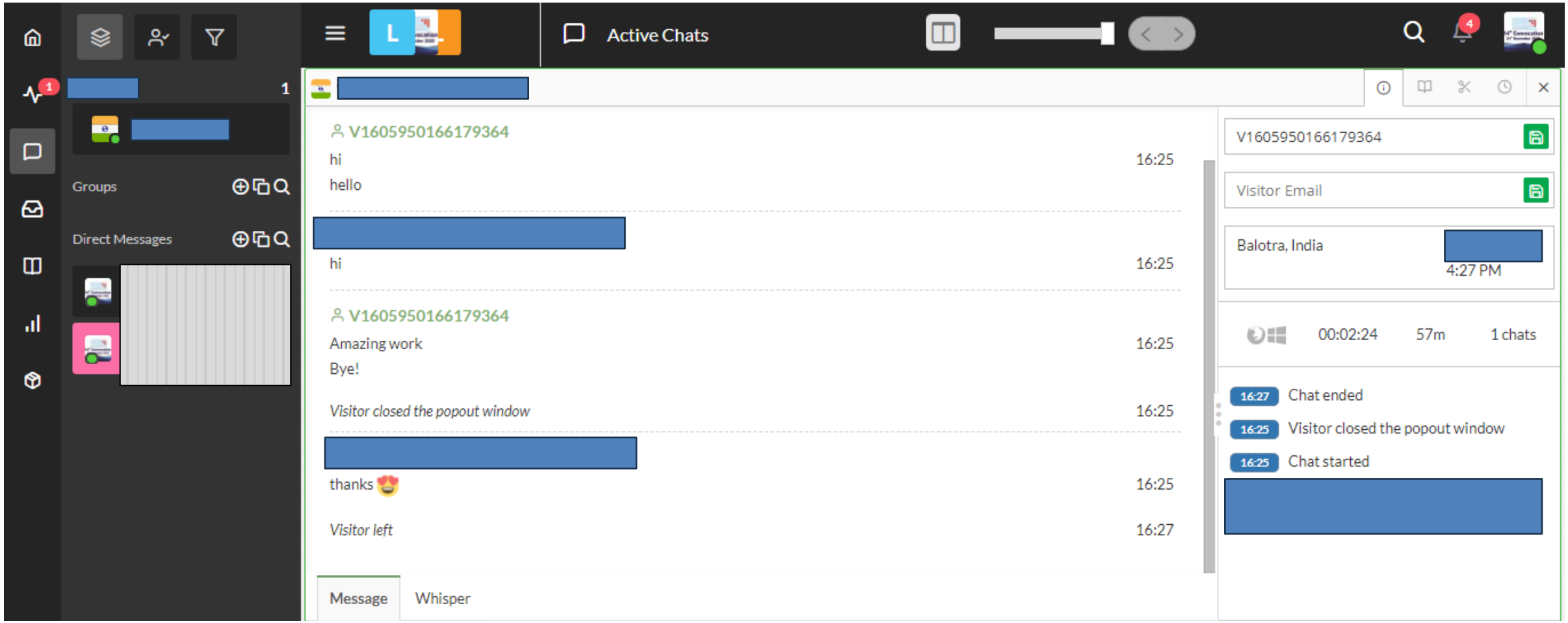
Hybrid Event: Landing Page



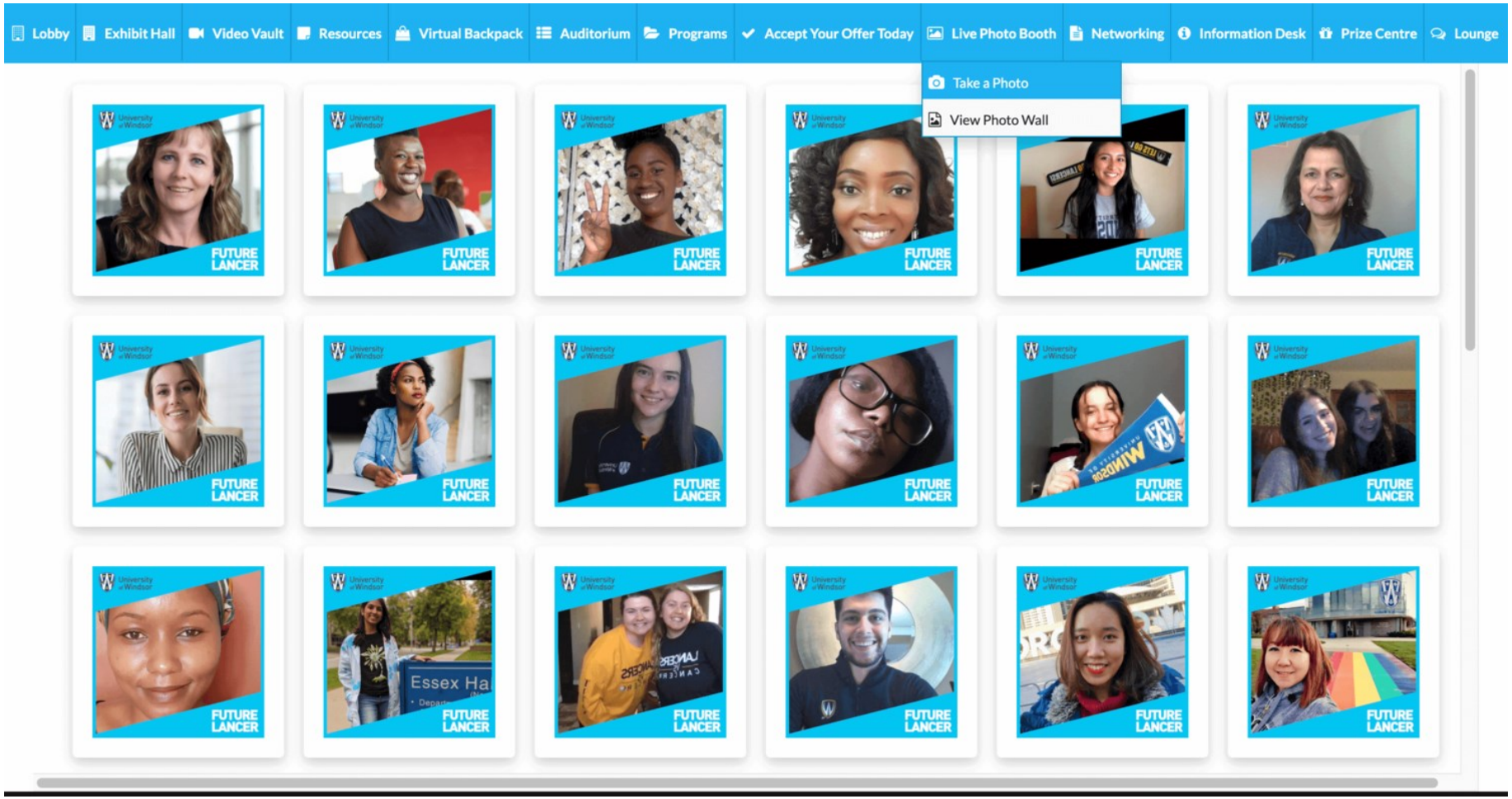
Hybrid Event: Help Chat FrontEnd



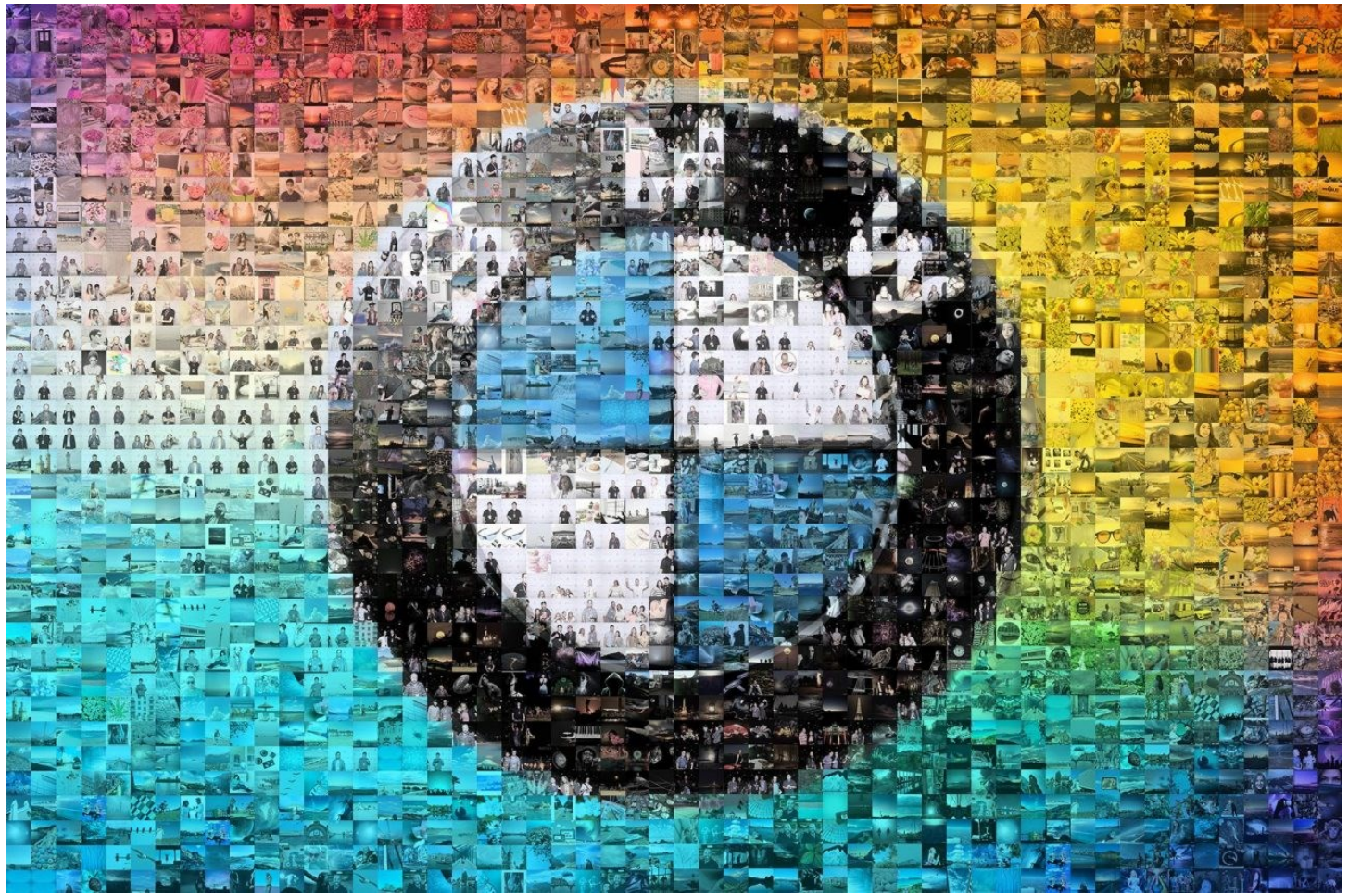
Hybrid Event: Help Chat BackEnd



Hybrid Event: PhotoBooth



Hybrid Event: Mosaic Wall



https://www.youtube.com/watch?v=BSwJCRKvmPc

Hybrid Event: Blowing Flower Effect

Hybrid Event: Virtual Address

Hybrid Event: Remote Connectivity

References

- Weiser, Mark. "The computer for the 21st century." *ACM SIGMOBILE mobile computing and communications review* 3.3 (1999): 3-11.
- https://en.wikipedia.org/wiki/Ubiquitous_computing
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- https://en.wikipedia.org/wiki/Fog_computing
- https://en.wikipedia.org/wiki/Virtual_event
- Virtual HLF 2020 - Heidelberg Laureate Forum
- https://en.wikipedia.org/wiki/Hybrid_event

תודה רבה
Hebrew

Ευχαριστώ
Greek

Спасибо
Russian

Danke
German

धन्यवादः
Sanskrit

Merci
French

ধন্যবাদ
Bangla

நன்றி
Tamil

شكراً
Arabic

ಧನ್ಯವಾದಗಳು
Kannada

Thank You
English

നന്ദി
Malayalam

多謝
Traditional Chinese

Grazie
Italian

ధన్యవాదాలు
Telugu

આભાર
Gujarati

ਧੰਨਵਾਦ
Punjabi

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