Deep Learning Week

25 – 29 July 2022

Overview

- The workshop is co-organised by LRZ and NVIDIA Deep Learning Institute (DLI).
- NVIDIA Deep Learning Institute (DLI) offers hands-on training for developers, data scientists, and researchers looking to solve challenging problems with deep learning.
- This online workshop combines lectures about Fundamentals of Deep Learning for single and for Multi-GPUs, Building Transformer-Based Natural Language Processing Applications and Deep Learning on LRZ systems.
- The lectures are interleaved with many demos and hands-on sessions using Jupyter Notebooks.
  For days 1 to 4, students will have access to a fully configured GPU-accelerated workstation in the AWS cloud.
  On day 5, the capabilities of the LRZ AI System will be showcased.

DEEP LEARNING INSTITUTE

DLI Mission: Help the world to solve the most challenging problems using AI and deep learning

We help developers, data scientists and engineers to get started in architecting, optimizing, and deploying neural networks to solve real-world problems in diverse industries such as autonomous vehicles, healthcare, robotics, media & entertainment and game development.

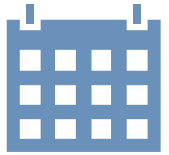
Lecturers

- **Lecturer**:
  - PD Dr. Juan Durillo Barrionuevo (LRZ)
- **Assistants**:
  - Dr. Momme Allalen (LRZ)
  - Dr. Volker Weinberg (LRZ)

All instructors are NVIDIA certified University Ambassadors.

1st day: Fundamentals of Deep Learning

- 10:00-10:20 Welcome and Intro
- 10:20-12:00 Introduction to Deep Learning and Deep Learning Training



- **12:00-13:00 Lunch Break**

All times are in CEST

- 13:00-14:20 Introduction to Convolutional Neural Networks and Data Augmentation

- **14:20-14:30 Coffee Break**

- 14:30-15:45 Deployment, Pre-Trained Models and Transfer Learning
- 15:45-16:00 Q&A

2nd day: Fundamentals of Deep Learning for Multi-GPUs

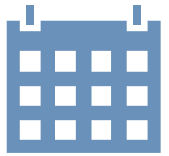
- 10:00-10:15 Intro
- 10:15-12:00 Stochastic Gradient Descent

- **12:00-13:00 Lunch Break**

- 13:00-14:20 Introduction to Distributed Training

- **14:20-14:30 Coffee Break**

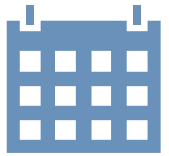
- 14:30-15:45 Algorithmic Challenges of Distributed SGD
- 15:45-16:00 Q&A



All times are in CEST

3rd day: Fundamentals of machine learning for working with texts and Building Transformer-Based Natural Language Processing Applications: Part 1

- 10:00-10:15 Intro
- 10:15-12:00 Working with text: From classifying images to generating Text



All times are in CEST

- **12:00-13:00 Lunch Break**

- 13:00-14:20 Machine Learning for Natural Language Processing: Fundamentals

- **14:20-14:30 Coffee Break**

- 14:30-15:45 Machine Learning for Natural Language Processing: Attention is all you need.
- 15:45-16:00 Q&A

4th day: Fundamentals of machine learning for working with texts and Building Transformer-Based Natural Language Processing Applications: Part 2

- 10:00-10:15 Intro
- 10:15-12:00 Transformer Based Models for Natural Language Processing

- **12:00-13:00 Lunch Break**

All times are in CEST

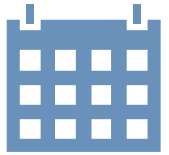
- 13:00-14:20 Hands On: Text Classifier and Named Entity Recognition

- **14:20-14:30 Coffee Break**

- 14:30-15:45 Transformer Based Networks in Production
- 15:45-16:00 Q&A

5th day: Deep Learning on LRZ Systems

- 10:00-10:15 Intro
- 10:15-12:00 Introduction to the LRZ AI Infrastructure



All times are in CEST

- **12:00-13:00 Lunch Break**

- 13:00-14:20 Introduction to the Compute Cloud for AI Inference and AI development

- **14:20-14:30 Coffee Break**

- 14:30-15:45 Hands on: Configuring a Cloud Instance for running AI workloads via JupyterLab
- 15:45-16:00 Q&A

Workshop Webpage

- All slides will be made available during the workshop under:
- https://tinyurl.com/dlweek22
- Further information on:
  - Agenda
  - Training Setup
  - Slides
  - Documentation

Training Setup

- To get started, follow these steps:
- Create an NVIDIA Developer account at http://courses.nvidia.com/join Select "Log in with my NVIDIA Account" and then "'Create Account".

- If you use your own laptop, make sure that WebSockets works for you:
  Test your Laptop at http://websocketstest.com
  - Under ENVIRONMENT, confirm that "'WebSockets" is checked yes.
  - Under WEBSOCKETS (PORT 80]. confirm that "Data Receive", "Send", and "Echo Test" are checked yes.
  - If there are issues with WebSockets, try updating your browser.
    We recommend Chrome, Firefox, or Safari for an optimal performance.

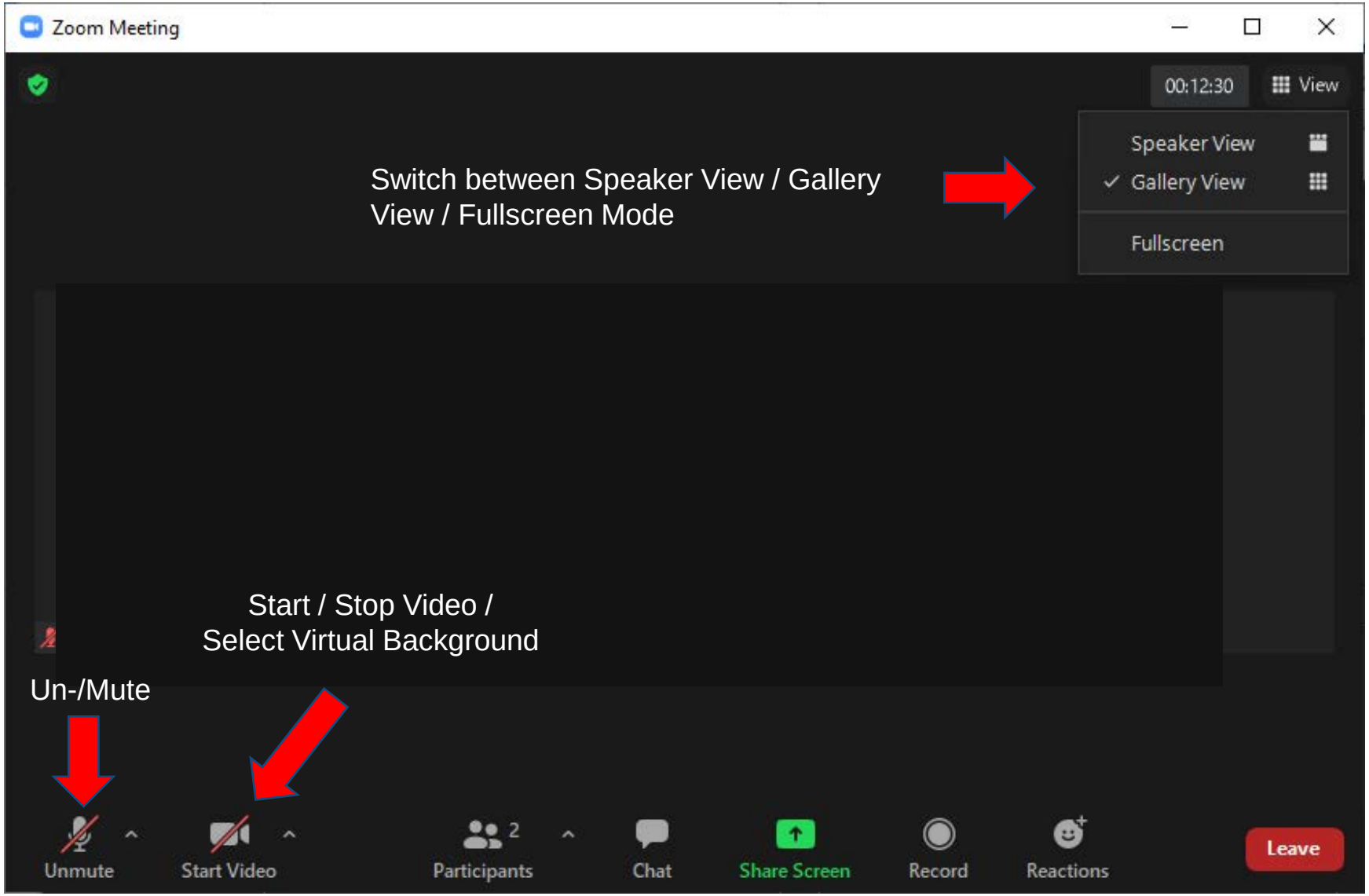
- Visit http://courses.nvidia.com/dli-event and enter the event code provided by the instructor.
- You're ready to get started.

Connection

- To ensure a pleasant experience with Zoom Meeting, we encourage participants to **download and install the latest Zoom application** via https://zoom.us/download.

- If you have problems with your computer audio, you can also **join by phone.** Find your local number: https://lrz-de.zoom.us/u/acivfXRFvy

Audio, Video, View

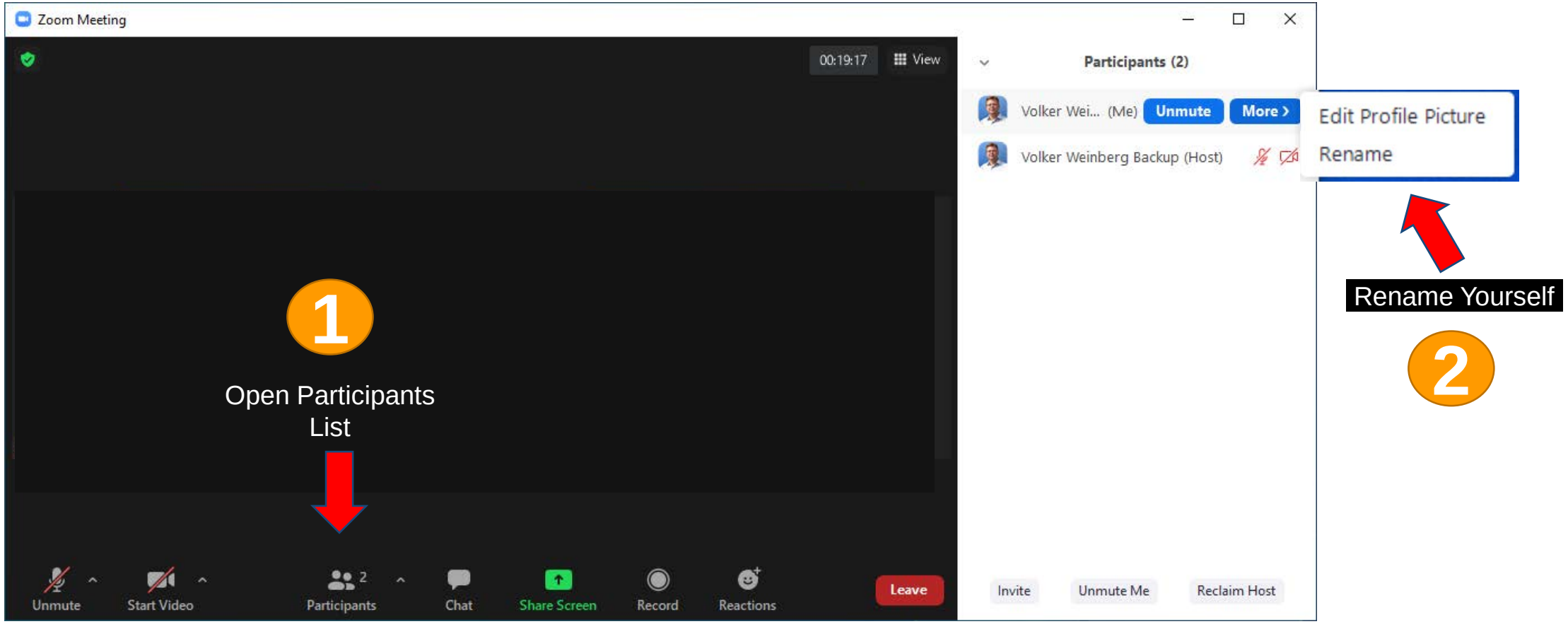


Participants List

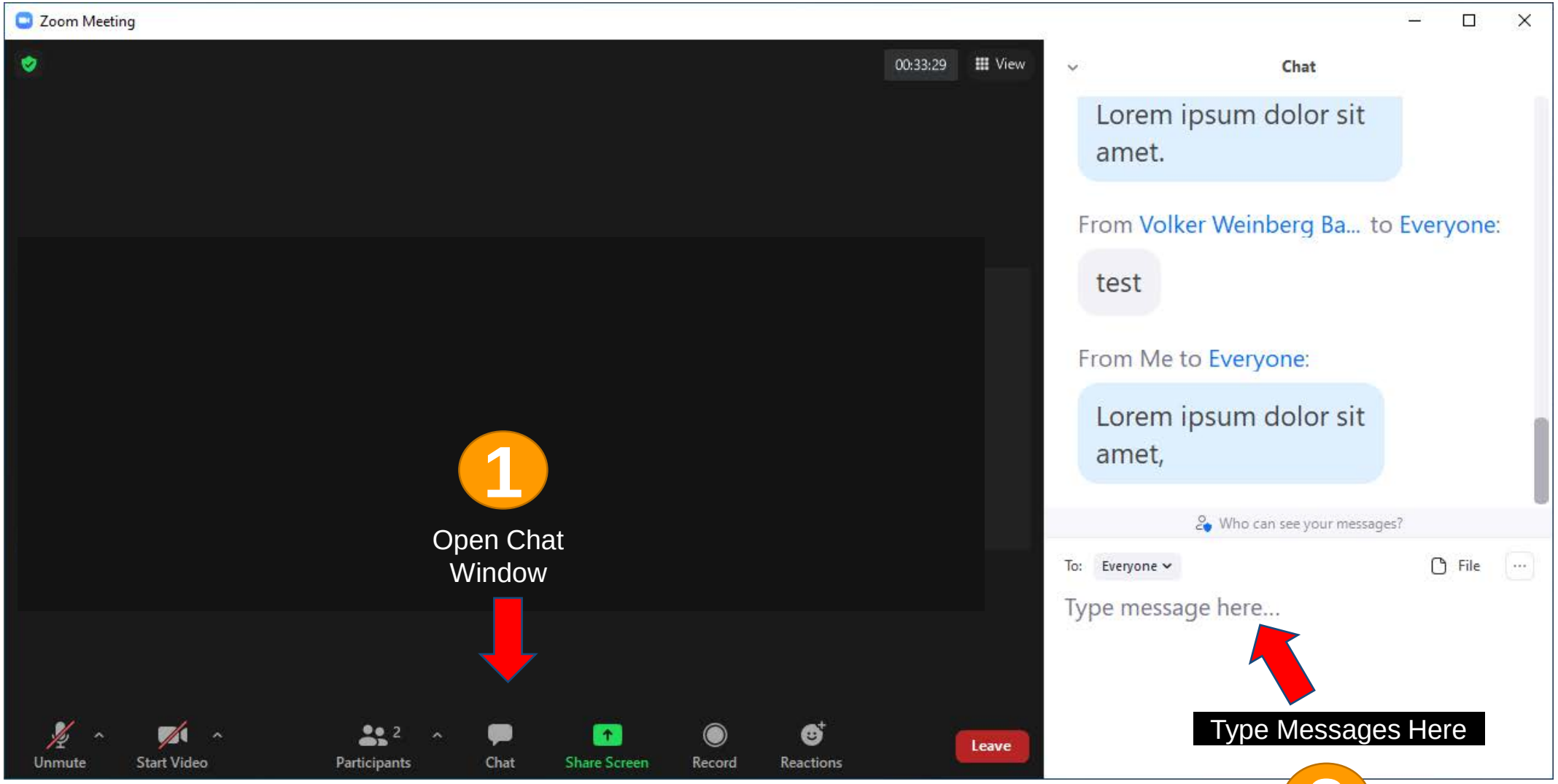
Kindly use “<first name> <last name> (<institute>)” as your screenname.

.

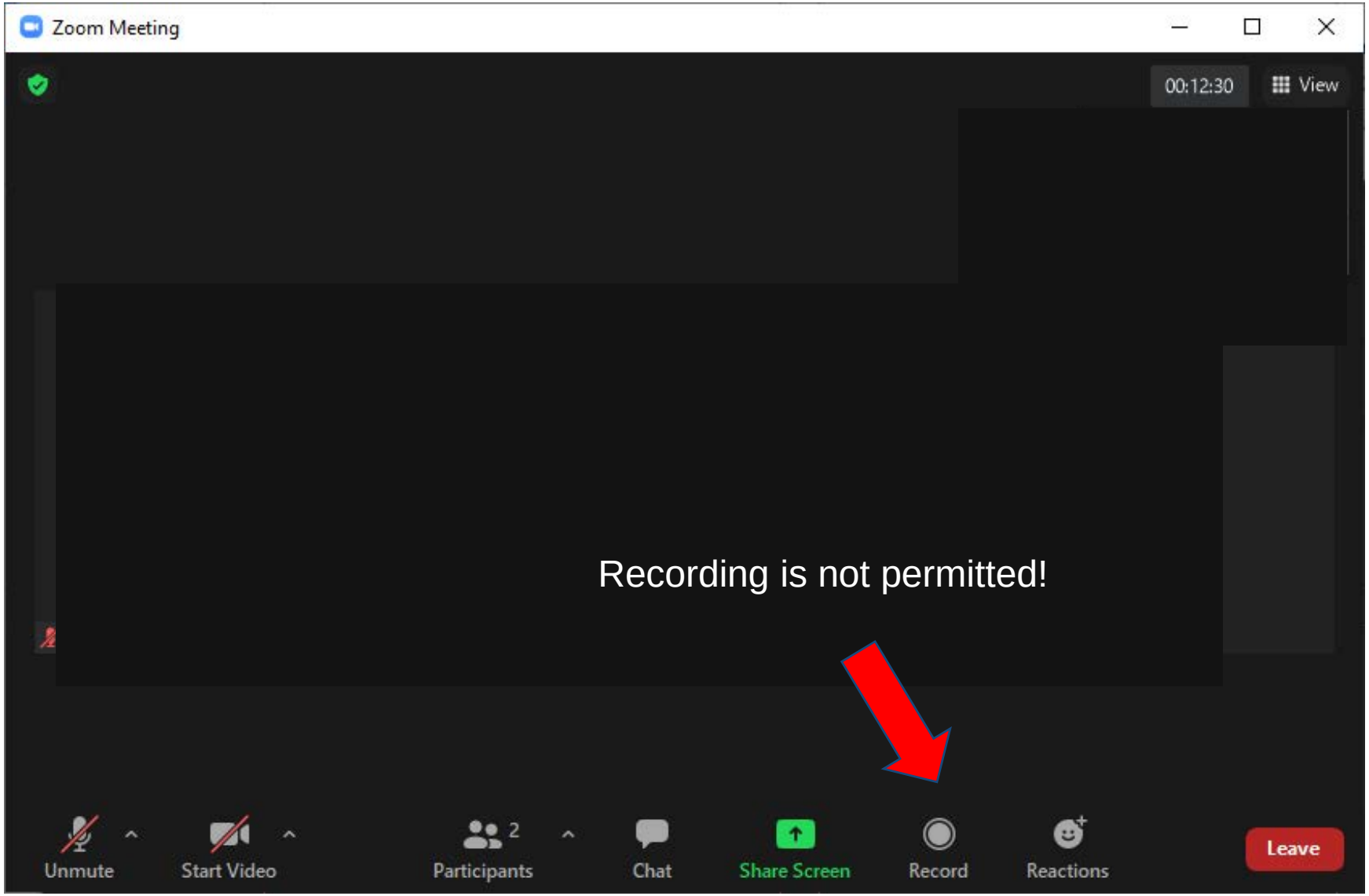
Otherwise you will not receive a certificate of attendance after the course.



Chat


Zoom Meeting
00:33:29
View
Chat
Lorem ipsum dolor sit amet.
From Volker Weinberg Ba... to Everyone:
test
From Me to Everyone:
Lorem ipsum dolor sit amet,
Who can see your messages?
To: Everyone
File
Type message here...
1
Open Chat Window
Unmute
Start Video
Participants
2
Chat
Share Screen
Record
Reactions
Leave
Type Messages Here
2

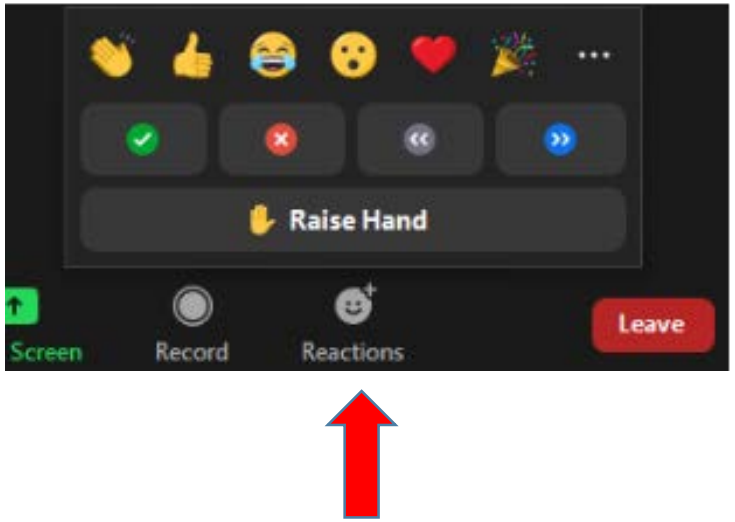
Zoom Recording



Q&A

- **Questions:**
  - **Raise your hand or use the chat window** if you have questions.
  - If you do not mind, please **show your video when asking questions** to make this workshop as interactive as possible.
- **Push to Talk:** The Push to Talk feature allows you to remain muted throughout the Zoom meeting and only if you hold down the spacebar you will be unmuted.

- **Instant Feedback:**



And now …

Enjoy the course!