Machine Learning for High Energy Physics
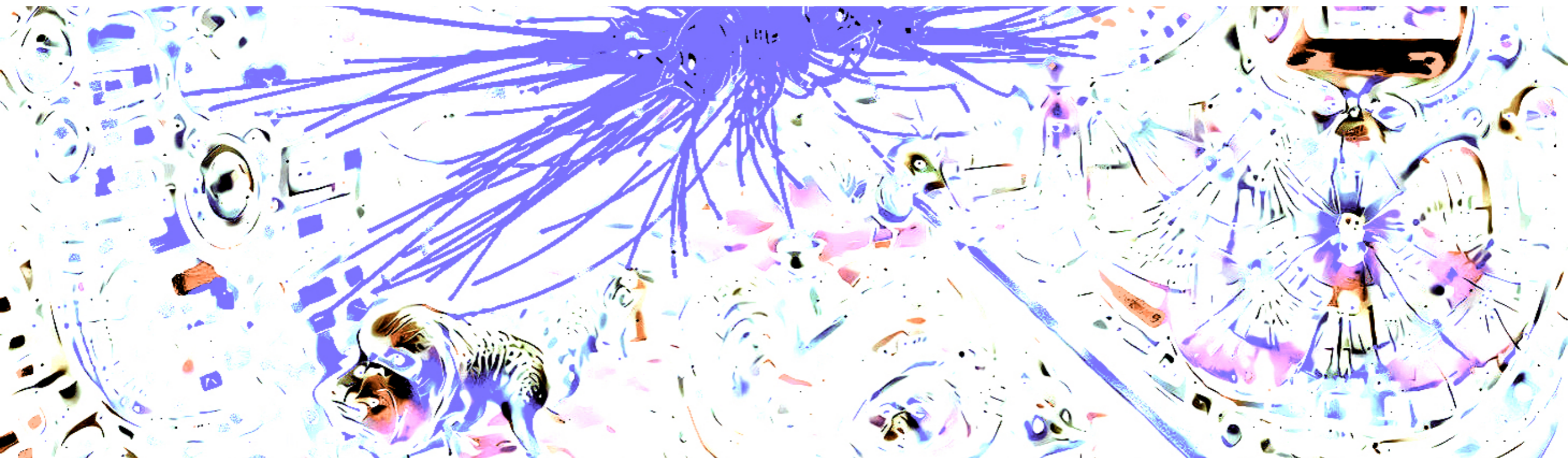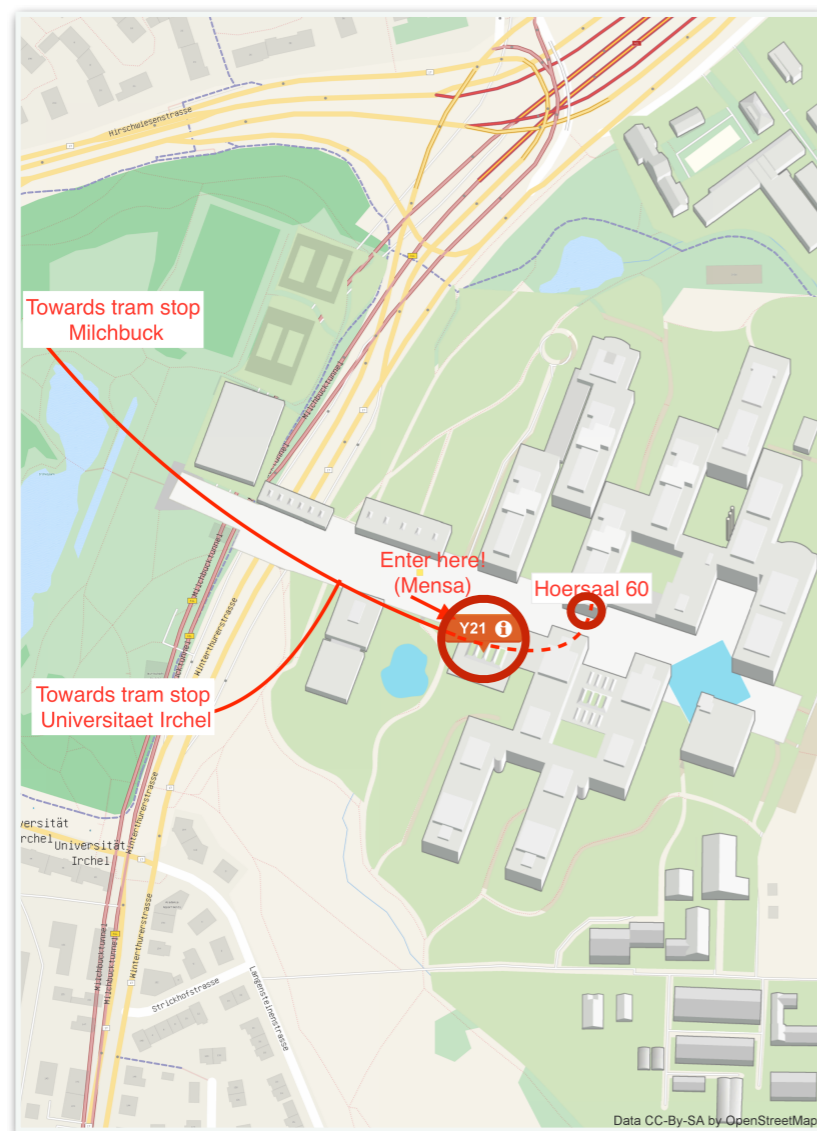
Welcome to UZH!
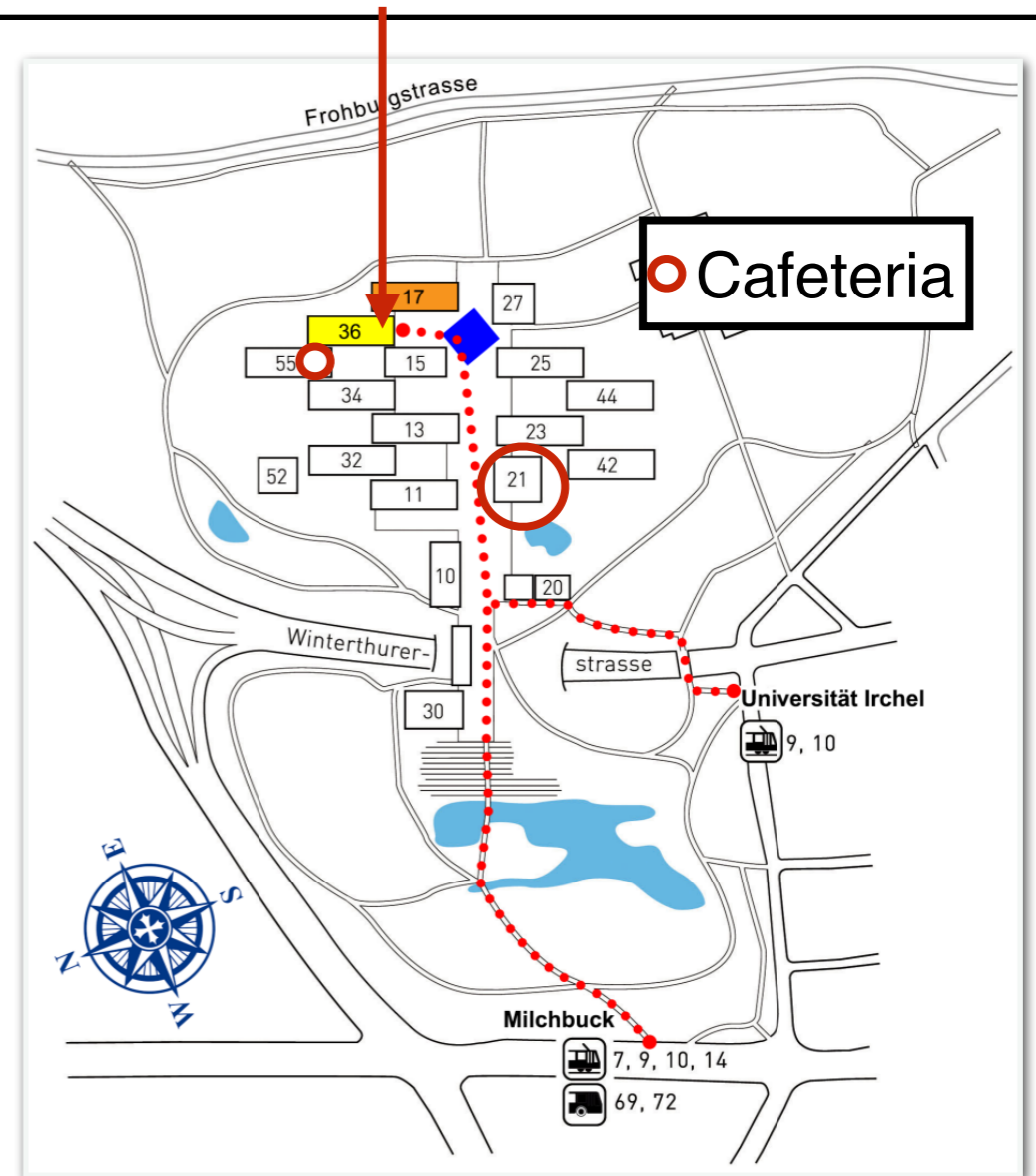
Today all day + tomorrow 14-18:
Y15-G-60

Tomorrow morning 9:30-12:
Y16-G-15

Towards tram stop Milchbuck

Enter here! (Mensa)

Hoersaal 60

Towards tram stop Universitaet Irchel

Data CC-By-SA by OpenStreetMap

Cafeteria

Frohburgstrasse

Winterthurer-strasse

Universität Irchel
9, 10

Milchbuck
7, 9, 10, 14
69, 72

Program

Today:

Morning session (09:30-12.15):
(Y15-G-60)
Basics of neural networks and training
Convolutional Networks

Coffee break at 10:45!

Afternoon session (14:00-16:30):
(Y15-G-60)
Recurrent architectures
Combining Physics and deep learning
Coffee break at 16:30!

Invited evening talk (17:00):
(Y15-G-60)
"ML and future challenges at HL-LHC"
Dr. Jennifer Ngadiuba (CERN)

Tomorrow:

Morning session (09:30-12.15):
(Y16-G-15)
Systematic Uncertainties
Learning from Data
Generative Networks
Understanding network decisions
Coffee break at 10:45!
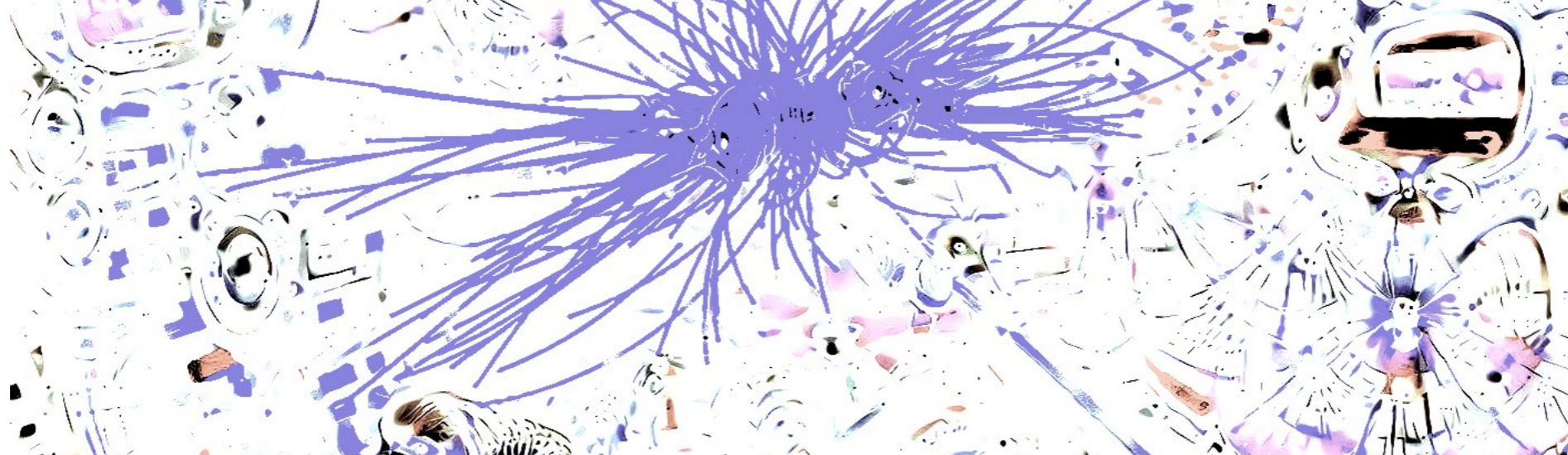
Afternoon session (14:00-16:30):
(Y15-G-60)
Hands-on exercises
Coffee break at 16:30!

Invited evening talk (17:00):
(Y15-G-60)
"Scaling up TensorFlow on Accelerator"
Marvin Ritter(Google AI)

Today   Deep learning and future challenges at HL-LHC
Jennifer Ngadiuba (CERN)

The High-Luminosity LHC (HL-LHC) is excepted to begin operations around 2026. With data rates more than 10 times previously achieved, it will bring major challenges to the entire detector system, from the collection and acquisition of data to the final analysis.
Solving such challenges is fundamental to fully exploit the new high-energy frontier and make physics discoveries at CERN possible.

In this talk, I will review some of these challenges and how recasting problems into Deep Learning problems can help to face them with great advantage for physics.

Mon 04.02.2019 at 17:00
Y15-G-60 Campus Irchel, UZH

Tomorrow   Scaling up TensorFlow on Accelerator
Marvin Ritter (Google Brain)

As deep learning is becoming main stream, several companies have begun the development of custom hardware for machine learning workloads. Recent work has shown that we can train models faster and better using such hardware. TensorFlow makes scaling to this hardware easy, achieving new state-of-the-art results in Generative Adversarial Networks, with potential applications in the area of high energy physics.

Tue 05.02.2019 at 17:00
Y15-G-60 Campus Irchel, UZH

ML4HEP

All slides will be available from course Indico page

https://indico.cern.ch/e/ML4HEP

Exercise material on virtual machines only

- remember to upload your code
  somewhere if you wish to access it later!

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