

PRELIMINARY AGENDA FOR PART C ON 28-Mar-2019, 16:30

WP1: Analyzing raw signal traces: to benchmark the (dis-)advantages of network architectures such as CNN, LSTM, autoencoder, ... we need a **benchmark set of signal time traces with different levels of noise contribution**. Who can contribute a suggestion for this benchmark data set? Aachen, Karlsruhe, Erlangen, Mainz, ...?

WP2: Reconstructing particles: to benchmark network architectures to cope with four-momenta we need benchmark sets of different complexity. The top-tagging benchmark of Gregor is already a suitable data set (ask him). We also need a **benchmark set for hadron decays** to test fully-connected, CNN, LBN, ... architectures. Who can contribute a suggestion for this benchmark data set? München, Münster, Karlsruhe ...? We also need a **benchmark set for quark-gluon-plasma transitions**: Frankfurt, Münster?

WP3: Simulation and data augmentation: we need benchmark data sets to be simulated by WGAN's etc., which should be identical to the benchmark data sets of WP2. Here we need to develop criteria to judge the quality of the modeled data. Usually the Wasserstein distance by itself seems not to be sufficient, to judge correlations within the modeled data it needs a network trained on the original data and trained on the modeled data. Who can contribute a suggestion for such a **benchmark on the quality of the modeled data**? Aachen, München, Karlsruhe,...?

WP4: Comparison of methods to visualize the **insight** of a network, who would like to contribute here? Aachen, Erlangen, Hamburg, ...?

Platform: Here we need suggestions how we want to exchange information. Two options are under discussion. **GitHub** is known to everyone. Alternatively, avoiding user installation work, try the **VISPA server** (google search for vispa rwth, or copy url to browser, make sure the url remains unchanged)

<https://vispa.physik.rwth-aachen.de>, request an account, confirm the email, login.

- On the almost empty screen goto the + on the upper left and pull down for *examples*.
- For a fast impression scroll down to Astroparticle Examples, open CRPropa Example, execute green button next to 'python %file'. Watch the code and the trajectories of cosmic rays in the universe.
- Go back to the example listing, Deep Learning, open Deep Generative Models. A directory MNIST_GAN opens, click on MNIST_GAN.py. Now we want you to execute in the queue instead of interactive, i.e. replace 'python %file' by '*pygpu %file*' and execute the program. Once finished look at the images in the directory MNIST_GAN.

Aachen will prepare a short VISPA tutorial for our meeting.