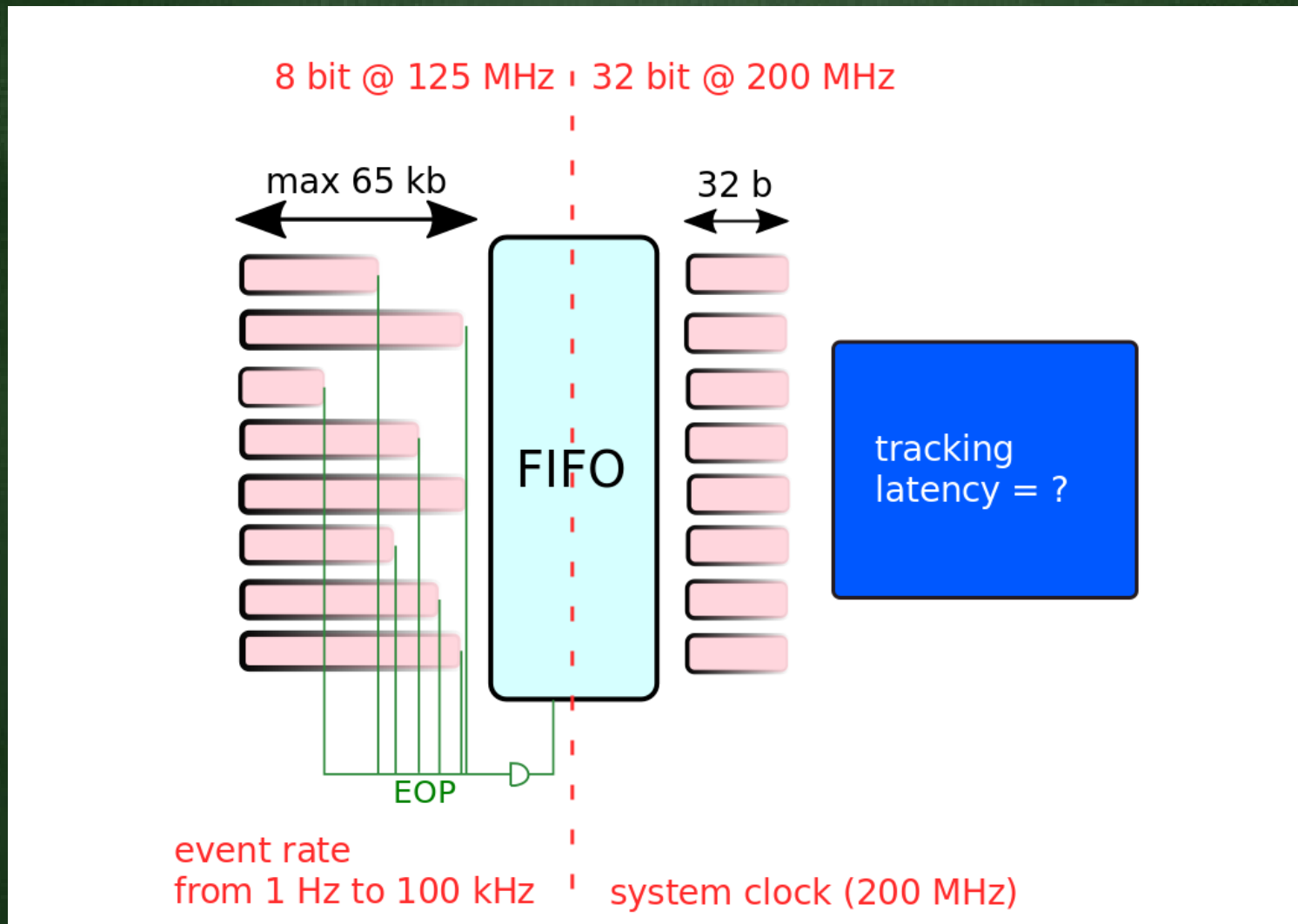


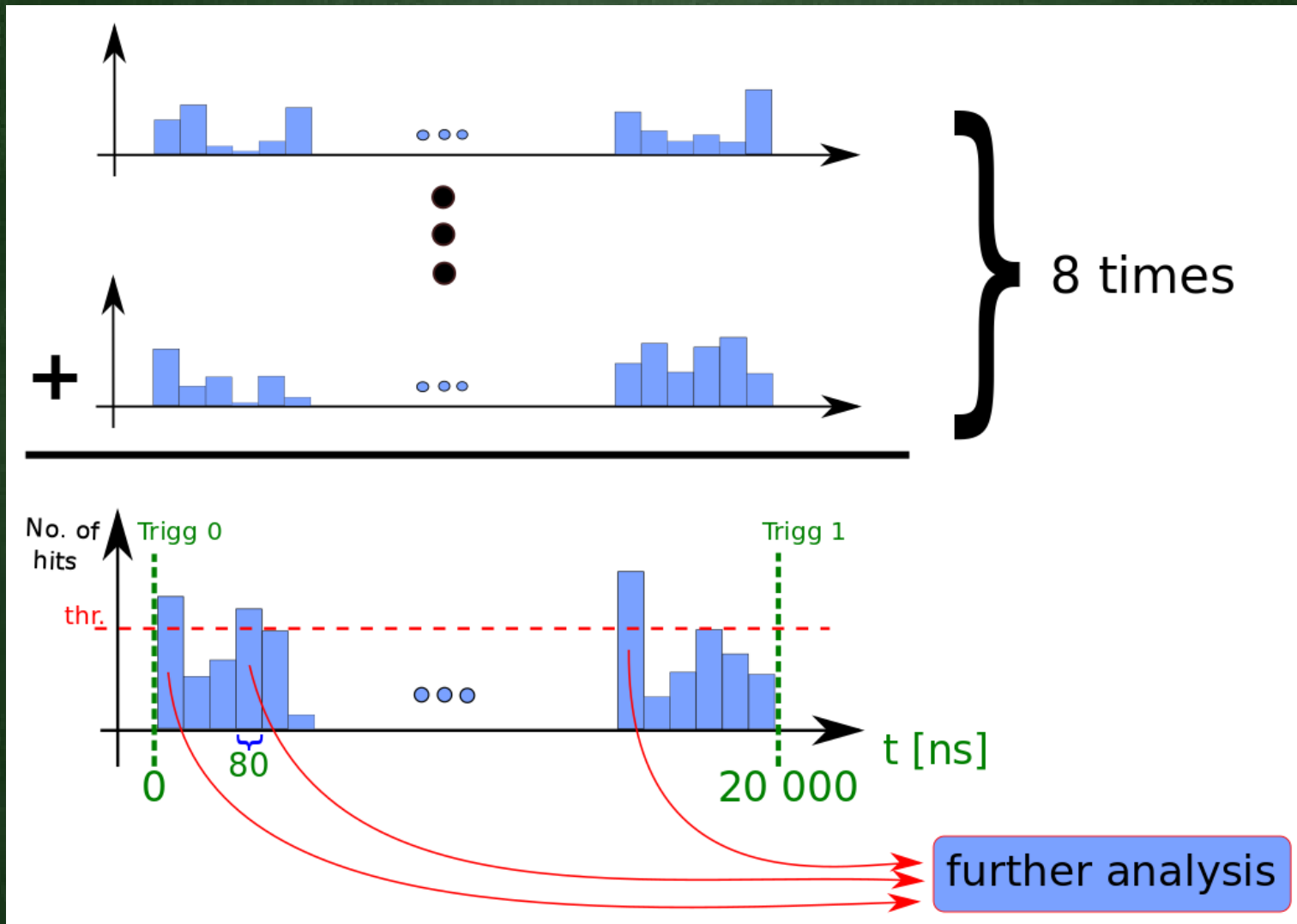
# „Research on Online Tracking”

*Krzysztof Nowakowski*

# Time constraints

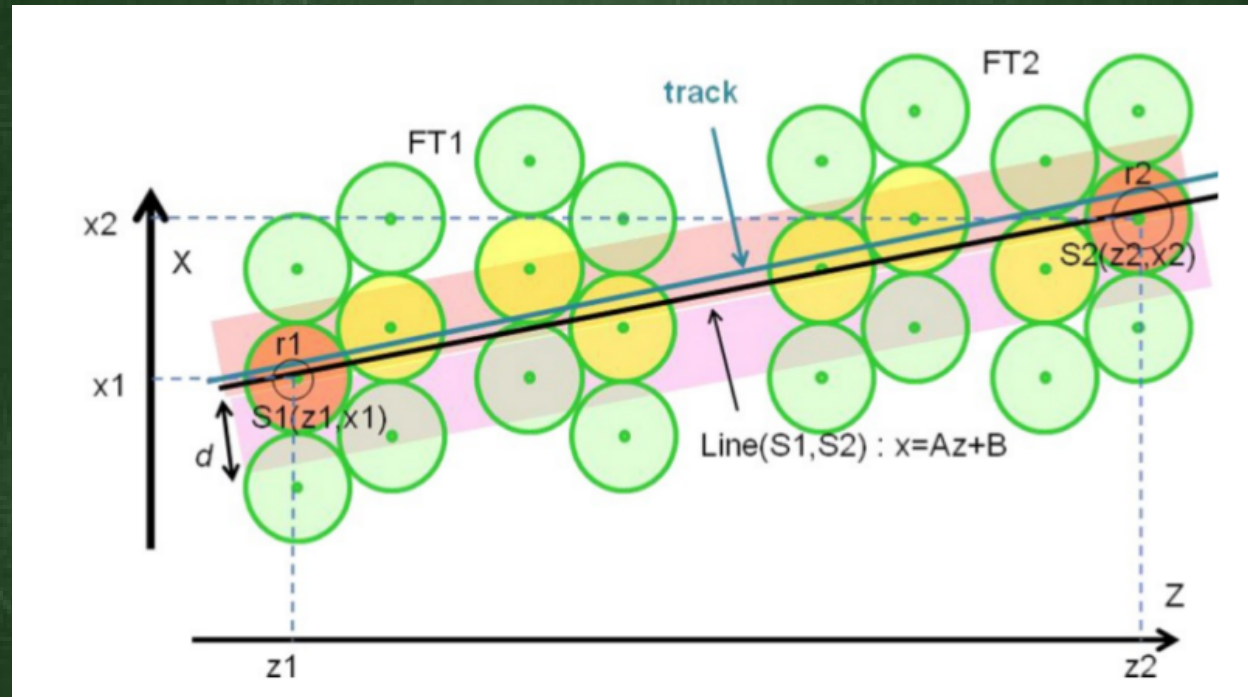


# Continuous readout



# Track recognition

Emilia Pieczonka (AGH) engineer's thesis

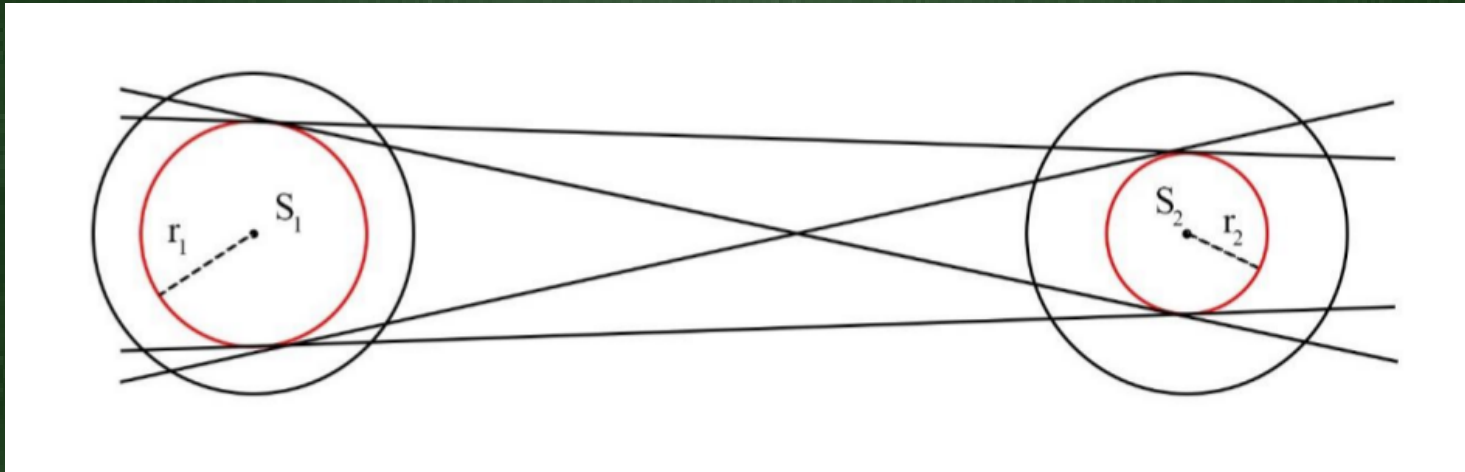


Algorithm:

1. Take a hit from the first and the last layer.
2. Calculate equation of line connecting straws.
3. Take all hits from the straws  $\pm d$  from the line.

# Tracking algorithm

Jakub Cierniak (AGH) engineer's thesis



algorithm:

1. Take the first and a last straw from the track. Calculate four possible lines tangent to circles.
2. For each possible track calculate distance between all drift circles and the track line.
3. Choose track with the smallest sum of distances.

# „FPGA Online Tracking Algorithm for the PANDA Straw Tube Tracker”

Yutie Liang, Hua Ye, Martin J Galuska et. al.

- „The track finder starts from hits in the innermost layer (H0). The hits in H0 are considered as a seed and are used to create a tracklet. Moving to the next layer, two adjacent tubes, tube 1 and 2 in the second layer are searched. If both adjacent tubes are not active, the next-to-adjacent tubes, 3 and 4, will be searched. With the attached hit in this layer, referring as H1, the tracklet is updated and extrapolated to the next layer, till the last layer.”
- „A fit fully considering drift circles by minimising the mean square distance from the fitting curve to drift circles, would make the calculation too complicated and not suitable for implementation in VHDL. Thus, a simplification by using the central position of each drift circle with the reversed drift radius as a weight is performed.”

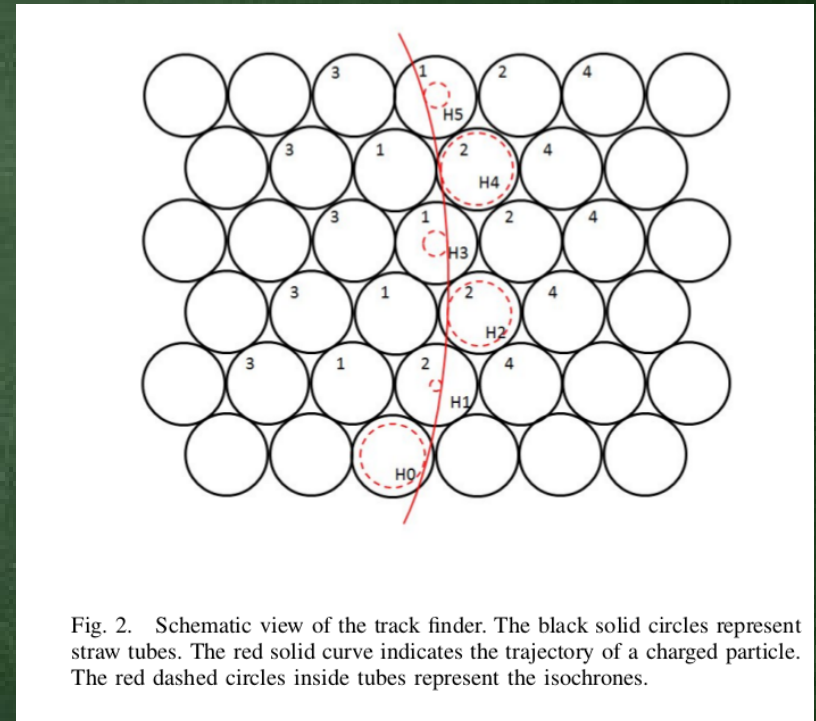


Fig. 2. Schematic view of the track finder. The black solid circles represent straw tubes. The red solid curve indicates the trajectory of a charged particle. The red dashed circles inside tubes represent the isochrones.

# Summary

- The continuous readout system will be developed and adopted for STT.
- Pattern recognition phase still require a lot of immersion.
- Whole system required tests with a real data.
- System is „under construction”.