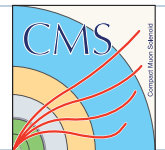


# SMARTHEP - ESR Projects and Industry partners

Henning Kirschenmann  
for the Helsinki CMS group



### **Exploit data scouting analyses at CMS:**

- ▶ Analyses at HLT level become increasingly important due to drastically increasing trigger thresholds during Run2
- ▶ Data scouting well established effort and setup to be versatile (reduction of event size by  $\sim 1000$ ).
- ▶ However, HLT reconstruction not optimal, yet. Potential improvements: E.g. flavour tagging with DNN just being proven to be fast enough for HLT-usage.
- ▶ Two areas: Improve general-purpose scouting + implement analysis-specific HLT-paths with heavier ML-usage for selection

### **Previous/current involvement of Helsinki group:**

- ▶ Helsinki group has been involved in Run2 dijet resonance search using “scouting” [i.e. trigger-based analysis]
- ▶ Previous/current tau and jet/MET HLT trigger conveners are part of the group
- ▶ Related expertise in jet energy calibration, charged Higgs search, established efforts in ML-techniques for reconstruction and analysis optimisation

# Potential industrial partners in Helsinki

---

**Helsinki area is full of global players and modestly-sized start-ups involved in data science. Many have Helsinki Institute of Physics [University] alumni.**

**Direct link via [known] alumni:**

## **Supercell**

- ▶ mobile game development company; millions of daily players; alumnus is data scientist for “Clash of Clans”

## **Eniram**

- ▶ onboard and on-shore energy management systems for optimised overall ship and fleet performance

## **Varian Medical Systems**

- ▶ leading player in radiation therapy; software development in Helsinki

[Other] big players who actively recruit students on-campus, so should be straightforward to get in touch

## **Nvidia**

- ▶ has R&D activities on Deep learning and Computer Vision

## **F-Secure**

- ▶ cyber security and privacy company

## **IBM**

- ▶ recently established “Watson Health Center of Excellence”

Smaller startups with some visibility on campus

## **Zen Robotics**

- ▶ using AI controlled robots to increase the recycling rate of waste with automation

## **The CuriousAI**

- ▶ Unsupervised R&D startup with “next gen” AI using ladder networks