



Contribution ID: 76

Type: **Talk (15min + 5min)**

Breaking down complex technology: Artificial Intelligence on Extreme Edge Networks

Thursday, March 7, 2024 9:20 AM (20 minutes)

As scientists, we frequently encounter the challenge of conveying complex research topics to a general audience. A prime example of this complexity is the field of artificial intelligence, which is currently undergoing unprecedented advancements - and many of these evolutions are hard to grasp for those not immersed in the community. When combined with other state-of-the-art developments, such as in the field of extreme edge computing, how can research still be made accessible to a wider public?

Our project steps into this space. We developed a novel approach that allows to distribute AI algorithms in a self-regulated manner across multiple devices within a wireless ad-hoc network. The network remains stable against connectivity fluctuations as, owed to its intelligent architecture, tasks can be redistributed automatically. In this process, not only one device takes over the execution of the neural network, but multiple nodes compute the task cooperatively. In order to demonstrate this technology, we built an interactive hardware demonstrator. It allows attendees to experience firsthand how their handwriting samples are processed, analyzed, and evaluated through a distributed computing process, which moreover can be actively controlled by regulating the individual devices during the action.

In our talk, we elaborate on the building process of this demonstrator. We reflect our experiences and challenges that emerged during the development, from the early concept stage up until the final continuous code integration phase. We will share insights into the practical hurdles we encountered, the software architecture and programming languages we used, the hardware solutions we adopted, and the lessons we learned along the way.

Slot length

Primary authors: SCHRAUTH, Manuel (Fraunhofer IIS); THOME, Moritz (Fraunhofer IIS); OHLENFORST, Torsten (Fraunhofer IIS); KREYSS, Felix (Fraunhofer IIS)

Presenter: THOME, Moritz (Fraunhofer IIS)

Session Classification: AI/ML Research Software

Track Classification: HPC and Massive Data: AI/ML Research Software