



The Swedish EuroCC Hub for High-Performance Computing

**We help you access and use  
CPUs/GPUs on European  
Supercomputers for Free**

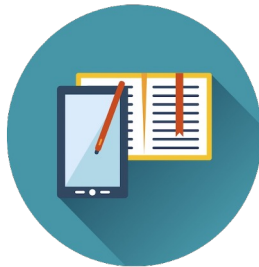
WHO WE ARE



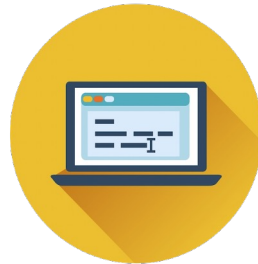
*ENCCS empowers Swedish **industry, academia and the public sector** to leverage **HPC, AI, HPDA and QC** efficiently and effectively.*



## HPC access



# Training



## Support



## HPC ACCESS | SUPPORT | TRAINING



- Meetings on a weekly basis with new potential EuroHPC users
- What is available?  
Which system is best for me and my group?  
How do we apply?  
What are the requirements?  
How can we get started?  
Is it really free?
- One-stop shop – if ENCCS can't help you, we hopefully know someone who can

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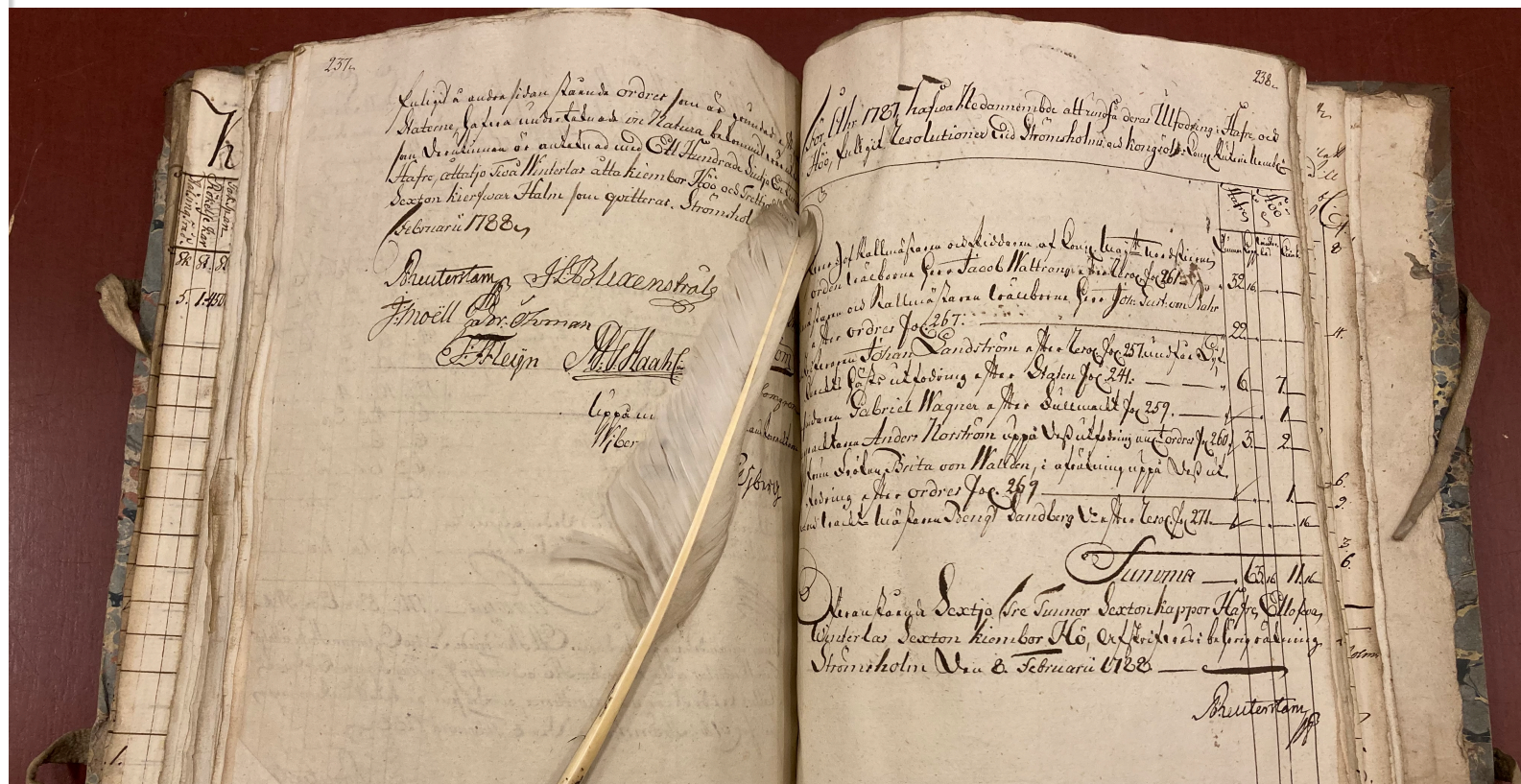
# ADAPTING AI-TECHNOLOGY FOR USE IN ARCHIVES

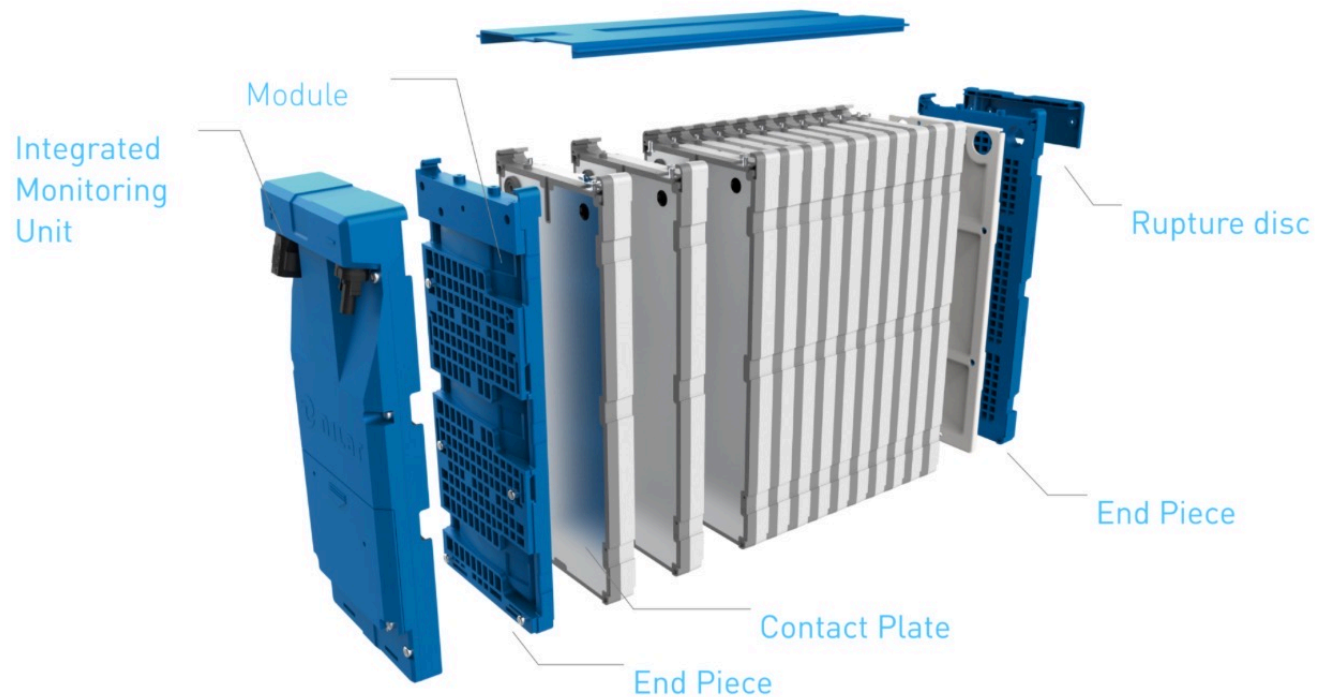
- Image segmentation models
- Text-recognition

Make scanned images searchable



Riksarkivet





# BATTERIES FOR STATIONARY ENERGY STORAGE

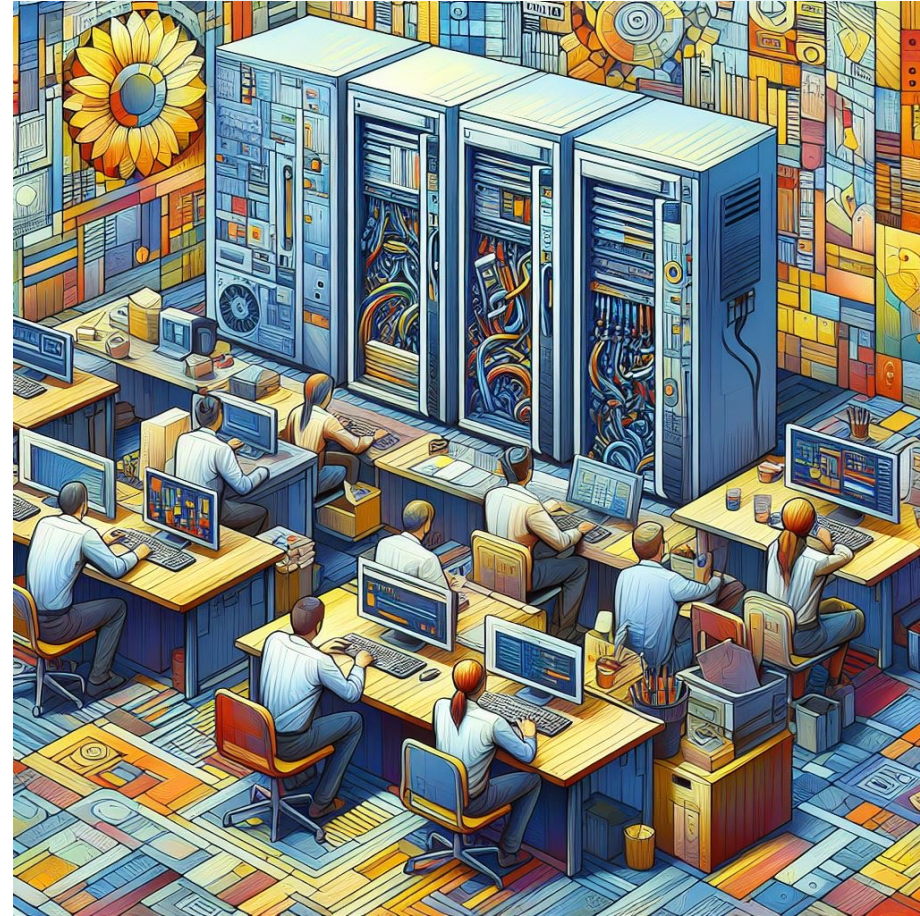
Optical inspection by using  
AI-based machine vision

- Speed up model training time
- Larger image datasets



- Beginner/intermediate/advanced level
- HPC, AI, HPDA, Quantum Computing
- Domain specific training
  - CFD
  - Quantum Chemistry
  - Biomolecular Simulations
- Workshops, Hackathons, Bootcamps, Seasonal schools
- Collaborations: Centres of Excellence, HPC centres, NCCs
- Public and open source training material, workshop recordings on YouTube

## HPC ACCESS | SUPPORT | TRAINING

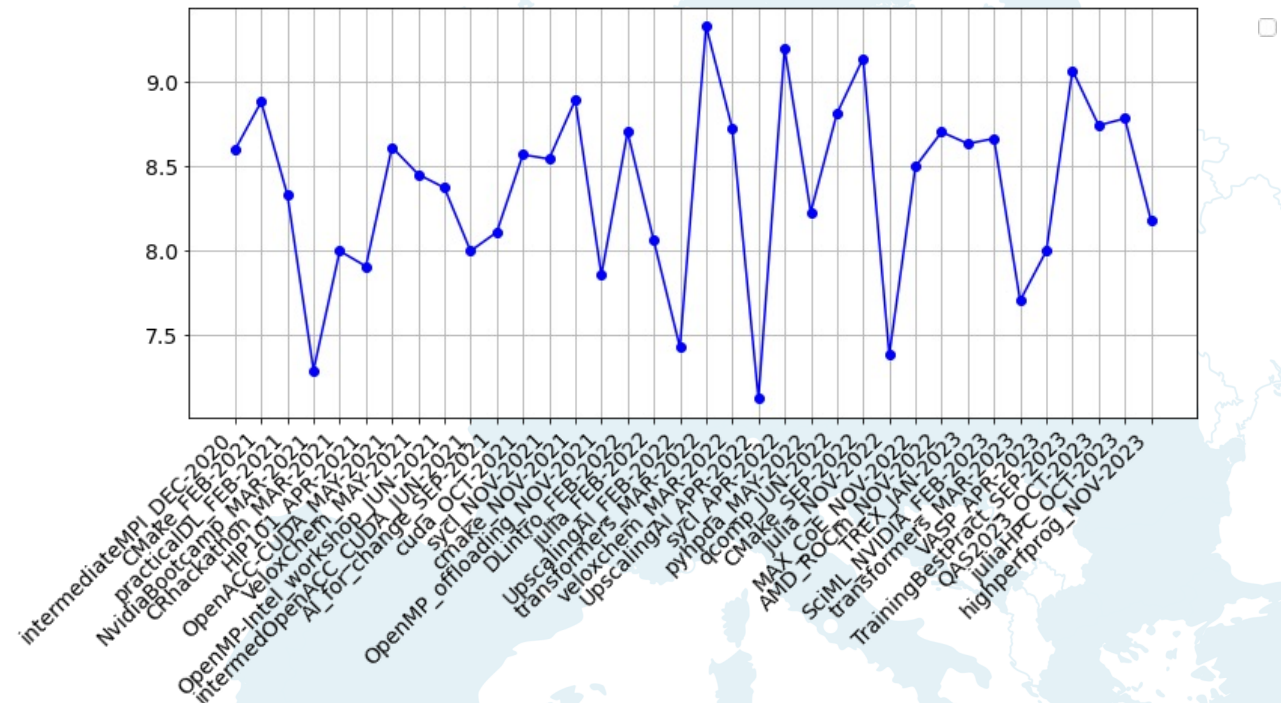


Generated by Dall-E 3

# HPC ACCESS | SUPPORT | TRAINING

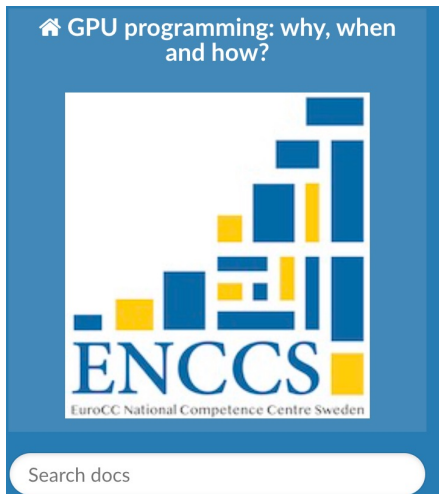
- Over 1500 people trained, ~10% from industry

Overall, how would you rate this training event?



 <p>High-performance Data Analytics with Python</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>Julia for High Performance Scientific Computing</p> <p><a href="#">COURSE MATERIAL</a></p> <p><a href="#">VIDEO RECORDING</a></p>	 <p>SYCL Workshop</p> <p><a href="#">COURSE MATERIAL</a></p> <p><a href="#">VIDEO RECORDING</a></p>	 <p>A.I. as a Tool for Change</p> <p><a href="#">VIDEO RECORDING</a></p>
 <p>Graph Neural Networks and Transformer Workshop</p> <p><a href="#">COURSE MATERIAL</a></p> <p><a href="#">VIDEO RECORDING</a></p>	 <p>Upscaling A.I. with Containers</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>OpenFoam Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>OpenACC Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>
 <p>Intermediate CUDA Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>Intermediate MPI Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>OpenMP for GPU Offloading Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>	 <p>NEK5000 Workshop</p> <p><a href="#">COURSE MATERIAL</a></p>





🏠 / GPU Programming: When, Why and How?

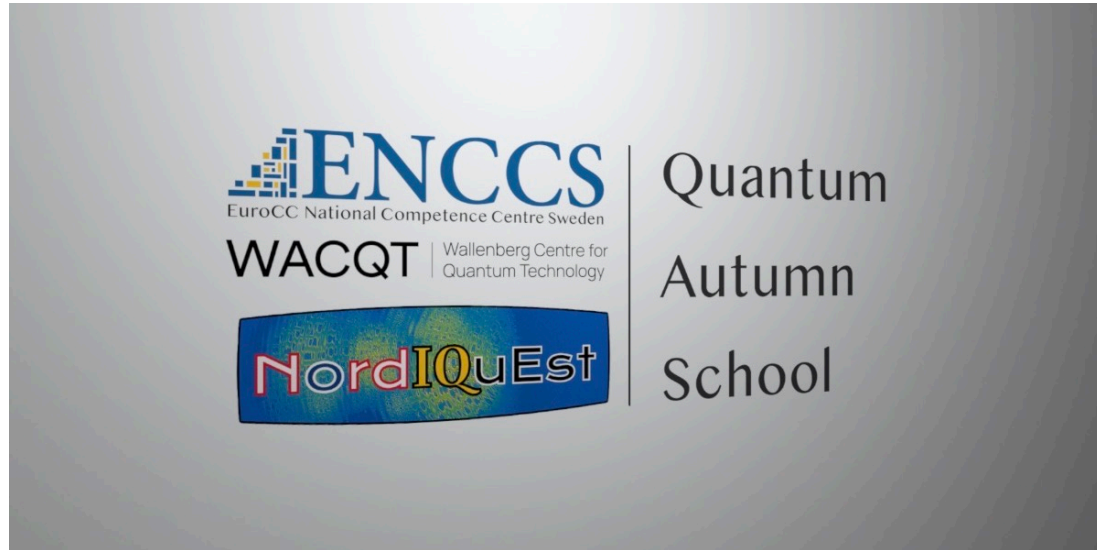
[Edit on GitHub](#)

### GPU Programming: When, Why and How?

Graphical processing units (GPUs) are the workhorse of many high performance computing (HPC) systems around the world. The number of GPU-enabled supercomputers on the [Top500](#) has been steadily increasing in recent years and this development is expected to continue. In the near future, the majority of HPC computing power available to researchers and engineers is likely to be provided by GPUs or other types of accelerators. Programming GPUs and other accelerators is thus crucial to developers of software run on HPC systems.

- Collaborative effort with partners from Norway, Denmark, Finland and Lithuania
- Front page on Hacker News
- Best practice guide to be published
- To be developed into MOOC



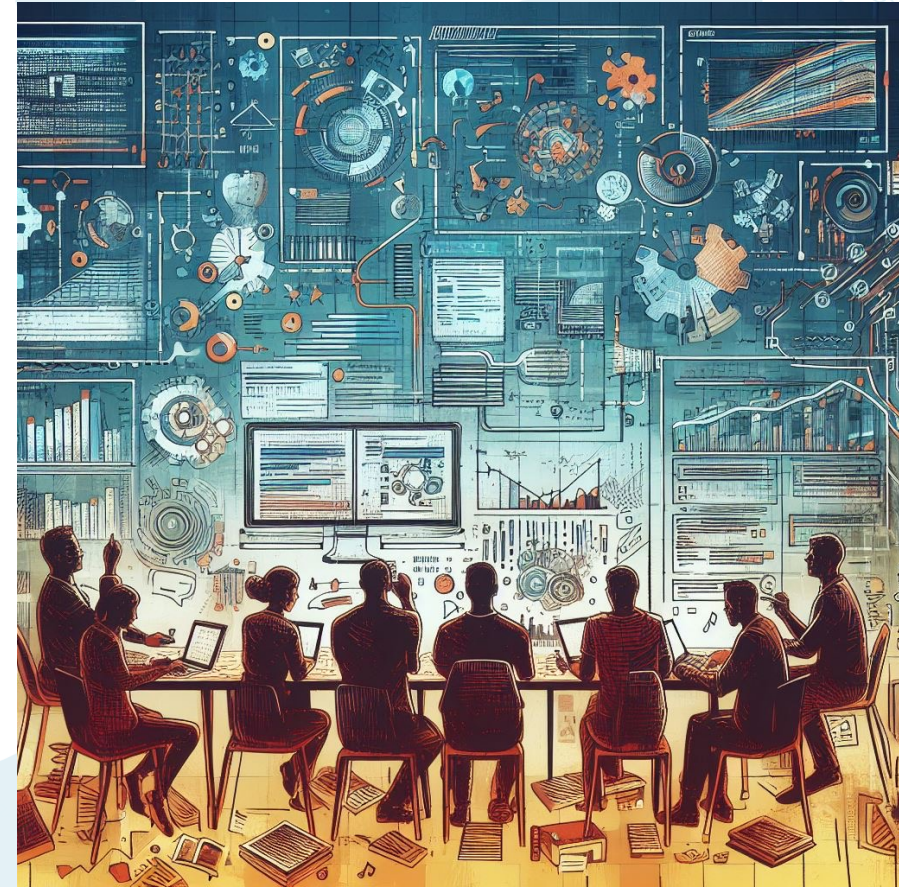


- Hybrid event with 40 participants in-person and 40 online
- Speakers and instructors from academia and industry



## HPC ACCESS | SUPPORT | TRAINING

- In phase 1 we contributed to academic software – GROMACS, VeloxChem, ICON, NEK5000 etc.
- In phase 2 we are transitioning to Proof of Concept projects
  - 3-6 month projects
  - 1-2 ENCSC experts
  - Matching contribution from client
  - Free of charge
  - *Technology transfer*



Generated by Dall-E 3





**EMTO-CPA** is an all-electron density functional theory code based on the Exact Muffin-Tin Orbitals formalism



**Colonies** is an open-source framework designed to facilitate seamless execution of computational workloads across cloud, edge, devices, or High-Performance Computing (HPC).





## SLB-ANALYS ANALYSE AIR POLLUTION FLOW USING MELUXINA SUPERCOMPUTER

Simulate wind fields for wind comfort simulations and dispersion of air pollutants in complex urban environments

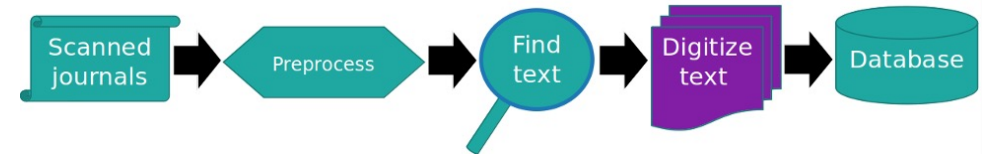
- Simulating larger urban area becomes possible
- Time-to-solution is greatly reduced
- Better results used for air quality assessment



# SMHI



## DIGITIZATION OF TABULAR DATA



- Meteorological agencies possess troves of archival observational data
- SMHI will train machine learning model to read different forms of tabular data
- Result will enable better understanding of climate – especially occurrence of extreme weather events

The image shows two pages of handwritten meteorological data from SMHI journals. The left page is titled "Väder" and contains a table with columns for time, temperature, barometric pressure, wind direction, and wind speed. The right page is titled "Väder" and contains a table with columns for time, temperature, barometric pressure, wind direction, and wind speed. Both pages also include sections for "Nederbördens beskaffenhet och tiden för densamma" (Nature and time of precipitation) and "Övriga anm. (åska, norrsken, frost m. m.)" (Other remarks (thunder, aurora, frost, etc.)).



EuroCC National Competence Centre Sweden

**HPC ACCESS | SUPPORT | TRAINING**



**SUCCESS STORIES**



LINKÖPING  
UNIVERSITY



EuroHPC  
Joint Undertaking



Swedish  
Research  
Council

**VINNOVA**  
Sweden's Innovation Agency

THANK YOU!



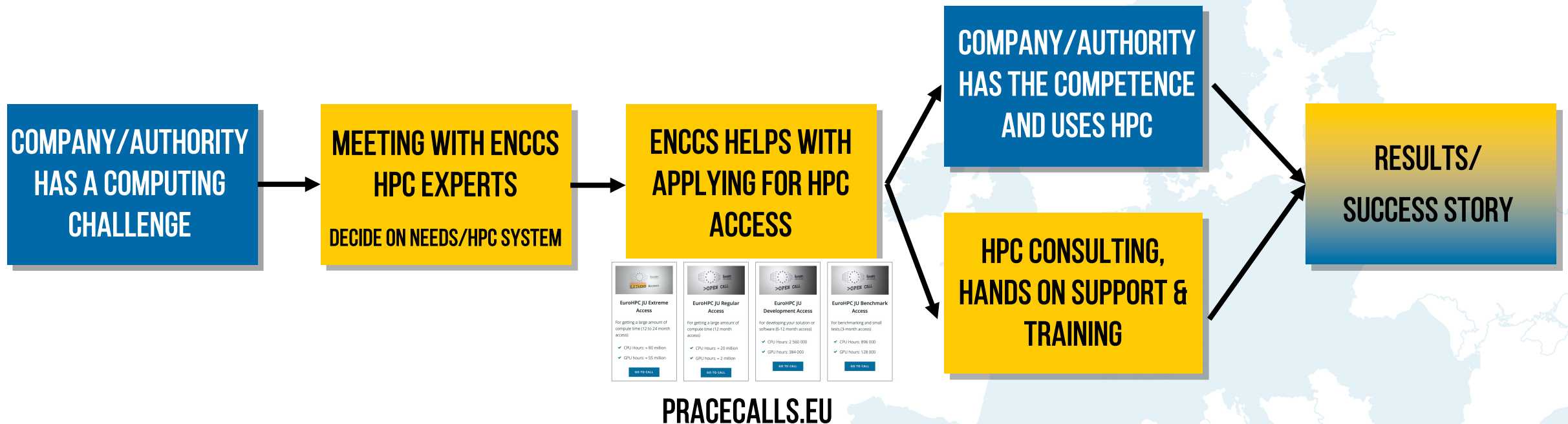
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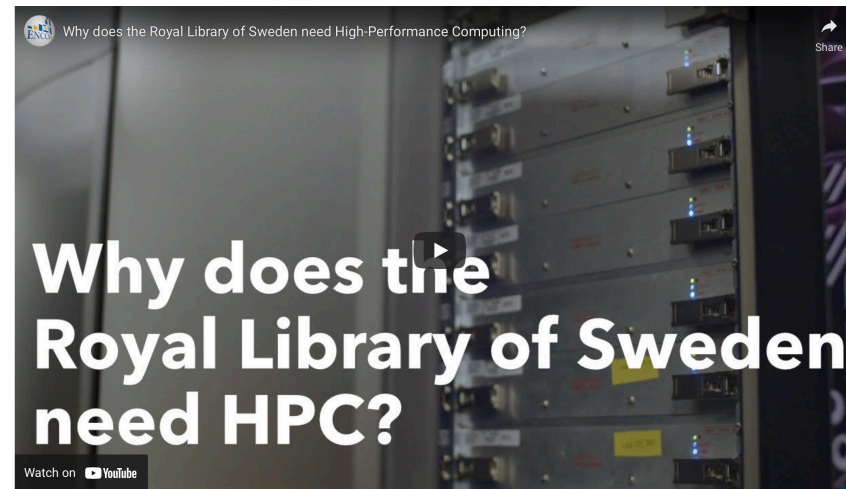
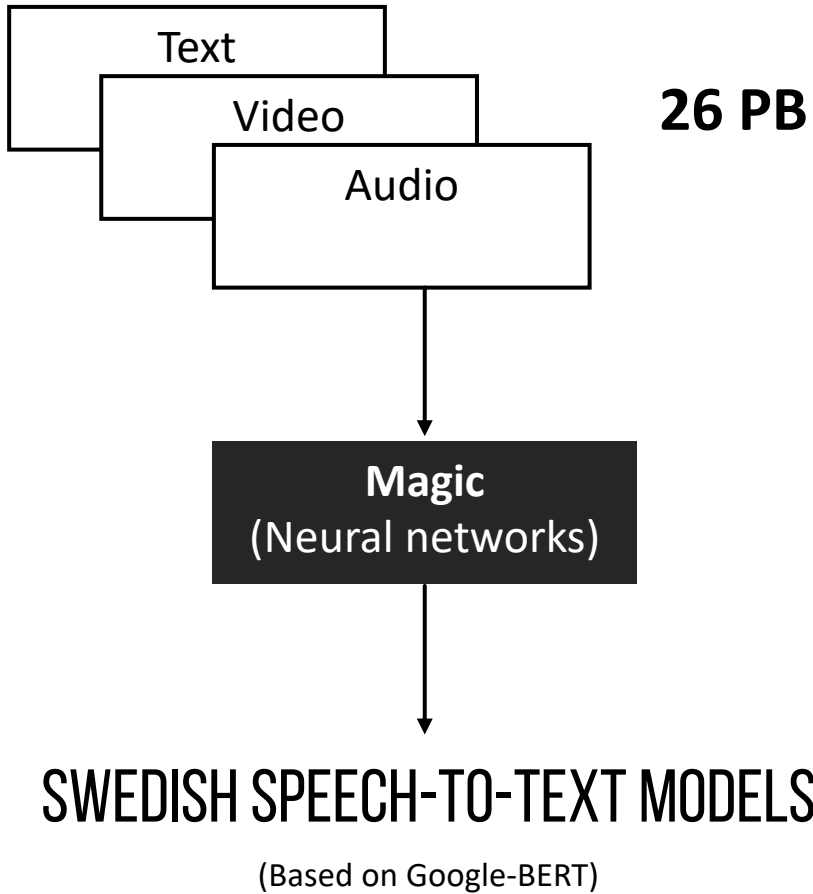
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Simulations of the electrochemistry  
relevant for battery development

Use of classical and reactive  
molecular dynamics and quantum  
chemical simulations to devise  
bottom-up design strategies for  
improved batteries

Software used:

- **LAMMPS** (for reactive force field simulations)
- **GROMACS**
- **psi4** (for sapt simulations)
- **ADF**

# northvolt

