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The Helmholtz Model Zoo: Enabling AI Model Sharing and Inference in the Helmholtz Cloud

The Helmholtz Model Zoo (HMZ) is a cloud-based platform that provides remote access to deep learning models within the Helmholtz Association. It enables seamless inference execution via both a web interface and a REST API, lowering the barrier for scientists to integrate state-of-the-art AI models into their research.

Scientists from all 18 Helmholtz centers can contribute their models to HMZ through a streamlined, well-documented submission process on GitLab. This process minimizes effort for model providers while ensuring flexibility for diverse scientific use cases. Based on the information provided about the model, HMZ automatically generates the web interface and API, tests the model, and deploys it. The REST API further allows for easy integration of HMZ models into other computational pipelines.

With the launch of HMZ, researchers can now run AI models within the Helmholtz Cloud while keeping their data within the association. The platform imposes no strict limits on the number of inferences or the volume of uploaded data, and it supports both open-access and restricted-access model sharing. Data uploaded for inference is stored within HIFIS dCache InfiniteSpace and remains under the ownership of the uploading user.

HMZ is powered by GPU nodes equipped with four NVIDIA L40 GPUs per node, hosted as part of the Maxwell cluster at DESY Hamburg. Model inference is managed through the NVIDIA Triton Inference Server, ensuring efficient GPU utilization. The development and maintenance of HMZ are led by the Helmholtz Imaging Support Team at DESY, with support from HIFIS and Helmholtz AI. Hardware and implementation have been supported by funds from the Haicore initiative.

The Helmholtz Imaging marks the release of the first beta version of the Helmholtz Model Zoo (HMZ). We invite you to join us in shaping the future of HMZ—upload your models, explore its capabilities, and share your ideas for new features. Your feedback and contributions will help make HMZ a powerful resource for AI-driven research within the Helmholtz community.

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