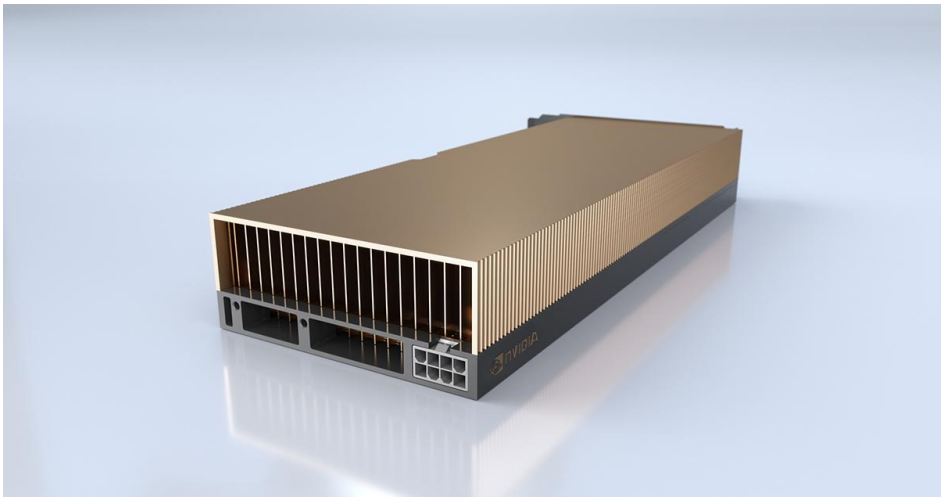
High-Performance Computing @ *SoME*

The School of Mechanical Engineering maintains several High-Performance Computing (HPC) servers to support advanced research and teaching in computational science and engineering. Designed to meet the growing demands of large-scale scientific computing, the facility provides faculty, researchers, and postgraduate students with the computing power necessary to address complex engineering and industrial challenges.

Hardware Infrastructure

At the core of the computing facility are multiple Dell PowerEdge servers equipped with the leading edge NVIDIA Ampere GPUs, optimized for high-throughput parallel computing. This hardware environment allows researchers to efficiently solve large, nonlinear, and multiphysics problems and deep learning models for data-driven problems that are beyond the scope of conventional desktop systems.



(Image from https://www.nvidia.com/en-gb/data-center/a40/)

Software

Our software ecosystem supports a broad range of applications central to modern mechanical engineering research, including:

- **Finite Element Analysis (FEA):** *Abaqus*, *ANSYS Mechanical*
- **Computational Fluid Dynamics (CFD):** *ANSYS Fluent*
- **Multiphysics and System Simulation:** *MATLAB/Simulink* and in-house developed solvers tailored to multiphysics and materials modeling
- **Deep Learning & Data-Driven Modeling**: *MATLAB/Deep Learning/Parallel Toolboxes, TensorFlow, PyTorch, scikit-learn*

Access to the Computing Platform

The servers run on Windows Server and Red Hat Enterprise Linux (RHEL). You will need remote access apps like AnyDesk and TurboVNC to connect to the servers.