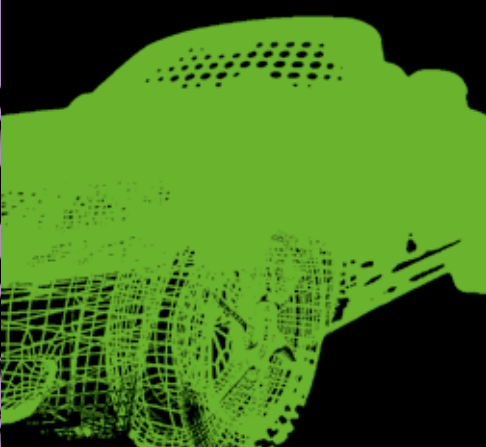




# lepccl

POWERING BUSINESS



# High Performance Computing

With High Performance Computing (HPC), tasks that take months on a standard desktop computer can be accomplished in hours or even minutes. Using parallel processing to deliver unprecedented computing capability, HPC unlocks new frontiers of problem solving, prediction and data analysis. Organisations of all sizes, from global enterprises to start-ups, are using HPC to support a broad range of applications. From modelling global supply chains to analysing genetic samples, no business activity is too big or too small to benefit from modern HPC.

Current applications include image rendering for creative industries, genomics and proteomics analysis for life sciences, simulations for engineering applications and data analysis for Earth observation. HPC's power is used to develop, manage and scale product development and manufacturing efforts. It underpins the training of innovative AI models, the evaluation of financial risk, and increased understanding of the data generated by business activity.

Through HPC, organisations can make new discoveries, create more reliable and efficient products, save money, and gain new insights in an increasingly data-intensive world.

# HPC & Data Science

Increasingly HPC is being combined with new techniques in data science to address large-scale and complex data challenges. HPC can be a key tool in unlocking real value from data – by creating new structures and relationships, dramatically speeding up AI models, discovering deeper and more valuable insights, and uncovering important correlations, patterns, and relationships.

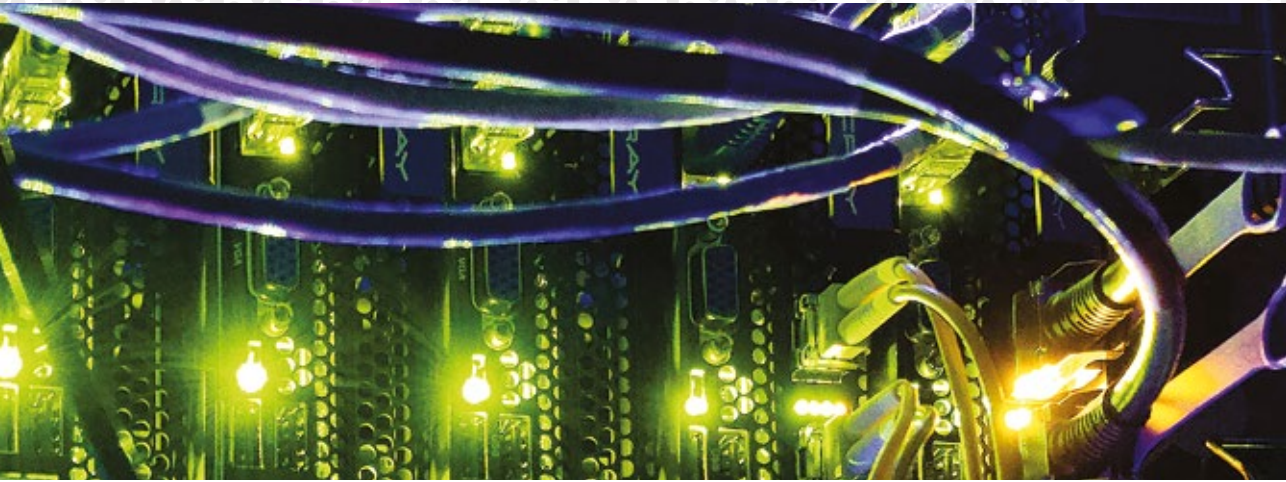
Combining HPC with rapidly evolving data science methods and toolkits such as graph analytics, machine learning, artificial intelligence, and semantic analysis can open up new horizons. Examples can be found in fields such as cryptography, optimising portfolios in financial services, and developing personalised medicines in healthcare programmes.





# EPCC: The UK's Leading HPC and Data Science Centre

Based at the University of Edinburgh, EPCC is the UK's only HPC centre with a global reputation. Since its inception in 1990, EPCC has gained an enviable reputation for leading-edge capability in all aspects of HPC. EPCC is built on three key foundations: the hosting, provision and management of high-performance computing and data science facilities for research and business; a world-leading consultancy service to support the computing activities of those organisations; and the creation of novel and high-performance software solutions.



Our facilities and expertise are unmatched in Europe. We operate the largest supercomputer in the UK, the ARCHER2 National Supercomputing Service, and have been chosen to host the UK's first Exascale system. We are also leading the way in operating the Edinburgh International Data Facility (EIDF), a private research Cloud-computing service, that fosters collaboration between academics and industry by bringing together high-value datasets and the computational infrastructure required to process them. Through EIDF, users can access a wide variety of state-of-the-art compute architectures. These range from high-memory virtual machines for data processing to AI-ready systems like our GPU cluster with over 100 NVIDIA A100 GPUs, our Graphcore Pod64, and our Cerebras CS-2s.

With over 130 highly qualified permanent staff, EPCC has an exceptional pool of talent. Our engineers and technical staff have a balanced blend of theoretical, academic and practical knowledge, with many having worked in industry before joining us. EPCC holds ISO 9001 accreditation for service quality, and ISO 27001 accreditation for information security management.

## EXPERTISE

- Large-Scale Computational & Data Techniques
- Code Parallelisation & Optimisation
- Advanced & Novel HPC Architectures
- Parallel Programming
- Cloud Computing
- Machine Learning

## UNRIVALLED SERVICES

- Computational Modelling & Simulation
- Data Management & Analytics
- Access to HPC & Data Science Facilities
- Software Development
- Training & Consultancy

|epcc|

## PEOPLE

- Exceptionally talented staff: Computational/Data Scientists, Machine Learning Experts, Engineers, Mathematicians & Physicists
- Powerful combination of practical and theoretical knowledge
  - Extensive industry experience



# Services and Solutions for Business

We're always looking for opportunities to work with you, to contribute to the ongoing development of the high-tech, knowledge-led economy. Spanning the spheres of hardware and software, we offer a skills-rich, imaginative environment where organisations can collaborate with us and each other to drive new ideas forward, test concepts, and assess the market potential of innovative products and services.

Collaborations can take many forms and can be funded through a variety of mechanisms that include UK and Scottish Government, UK Research Councils, Scottish Enterprise, and industry.

## **HPC On Demand: Access to HPC and Data Facilities**

Cost of entry is arguably the biggest barrier restricting the uptake of HPC. Our on-demand service eliminates the requirement for capital expenditure by giving you access to our HPC, data, and associated facilities as and when you need them. This service is fully scalable, and its simple, clear, and flexible pricing model provides an affordable entry point to capabilities with the potential to transform your business.

## **Data Management and Analytics Services**

The vast storage space and multi-core processing power of our systems mean they can quickly convert your data into meaningful business intelligence. We have expertise in distributed computing (with a focus on service-oriented and Cloud computing), as well as data integration and data analytics. We can also give honest and impartial advice on the best available commercial and open-source solutions.

### Computational Modelling and Simulation

Modelling and simulation are popular methods of designing, developing and testing new products and services. Finite-element analysis and computational fluid dynamics application packages have become standard for most manufacturing companies. However, many simulation codes do not scale beyond a few tens of processors, meaning that attempts to run them on HPC systems will either fail completely or result in the code running slower. We can improve the scaling of in-house and independent software-vendor codes through optimisation and re-engineering so that companies can undertake faster, larger, and more meaningful simulations.

### Consultancy for Business

Strong relationships with key hardware and software vendors ensure we operate at the forefront of technology, while our independence guarantees our solutions are impartial and deliver the best value for money. Our clients range from start-ups, through to small and medium sized companies and multinationals.

### Software Development and Optimisation

One of our core objectives is to develop, demonstrate, and deploy software that can scale to the largest new and next-generation computing architectures. Whether writing new algorithms or optimising existing code, we open the door to the handling of ever larger datasets and the exploitation of unprecedented, sophisticated modelling and simulation capabilities.

We can help you enhance your existing software and push new products and services forward. Our HPC systems and modelling and simulation capabilities, together with our supporting expertise, will also deliver the problem-solving skills you need to create and innovate on a whole new level.

### Training

Users, developers and business managers can all benefit from EPCC's highly regarded training courses. We are Europe's leading HPC training centre and our courses can be tailored to suit your requirements. All our training courses are delivered by highly experienced HPC practitioners and provide both theory and practical sessions to maximise learning impact.

# Unparalleled Facilities

## EPCC Systems

EPCC hosts and manages a unique collection of leading-edge HPC systems and data resources at the University's Advanced Computing Facility (ACF), a secure state-of-the-art building located on the outskirts of Edinburgh. Our large computing power combined with huge data storage capacity distinguishes us from all other UK-based HPC facilities, commercial and non-commercial alike.

Energy efficiency is at the heart of everything we do at the ACF and has been for the past 20 years. We use electricity from renewable sources only and ensure these are REGO (Renewable Energy Guarantees of Origin) certified. EPCC is leading the way in developing energy-efficient software and can work with you to optimise your code and make it energy efficient, thereby directly reducing your costs.

## ADVANCED SUPERCOMPUTING SERVICES

- ARCHER2: UK National Supercomputing Service
- Cirrus: Hybrid CPU+GPU system
- EIDF: Cloud computing facility for AI and Data Science

## LARGE-SCALE DATA INFRASTRUCTURE

- Multi-petabyte data storage
- Backup
- Archive

## ON-DEMAND ACCESS

- Secure
- Easy to use
- Cost effective





# On-Demand Computing

Our on-demand computing service brings leading-edge HPC capability directly to your desktop. It is targeted at engineers and scientists solving complex simulation and modelling problems in fields such as materials chemistry, computational fluid dynamics, finite element analysis, life and Earth sciences.

Through a remote internet connection you gain cost-effective access to a range of large-scale, multi-core, high-end compute resources:



**ARCHER2:** Access to over 750,000 cores of high-end compute, ideal for solving large-scale simulation and modelling challenges across a range of computational science disciplines.



**Cirrus:** Access to 10,000 cores and over 140 GPUs for solving extremely complex modelling and data science problems. Cirrus is an ideal platform for running users' own codes or large-scale open-source codes such as OpenFOAM.



**EIDF:** A powerful, flexible infrastructure providing a range of data and analytical services. EIDF's world-class resources include AI-ready compute, toolkits, software, and data storage and management services.



**RDF-as-a-service:** Large-scale data facility provides access to petabyte-scale data storage and archive facilities.



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of EDINBURGH

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together we advance\_



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