Solving Client Challenges with High-Performance Computing

Noblis' high-performance computing (HPC) services foster client adoption of artificial intelligence (AI) and analytic solutions across national security, law enforcement and federal civilian markets.

Noblis has the Right Tools and Platforms to Support Big Data Projects and Capabilities

Our HPC system is implemented as an on-premises cloud, allowing quick deployment of computational infrastructure on demand. Our subject matter experts have experience with a diverse set of platforms. This experience, coupled with our ability to remain platform agnostic, allows our experts to work within any infrastructure and help our clients solve mission challenges.

Our experts solve mission challenges in areas such as:

- Resilient Systems
- Molecular Science
- Biometrics Forensic Analysis
- Cybersecurity Analysis
- Inference-based Systems
- Discrete Event Simulation
- Intelligence Analysis
- Predictive Maintenance
- Multimedia Analysis
- Persistent Surveillance

Our on-premise cloud environment consists of:

- An NVIDIA GPU environment which is the leading platform for AI/ML applications.
- The NVIDIA A100, which is the universal system for all AI workloads, offering unprecedented computer density, performance and flexibility in the worlds first 5 petaFLOPS AI system.
- Two additional high-performance clusters.
- All platforms in the cloud can be implemented together when necessary.
- All systems share the same algorithms and the same benchmarking.

A Full Suite of Enterprise Applications to Power Innovation and Scientific Advancement

Noblis offers our clients and scientists a full suite of enterprise frameworks, applications and software environments to drive research and innovation. This includes a diverse array of development environments, development, security and operations (DevSecOps) tools and AI/machine learning (ML) libraries.

Using the Power of HPC to Solve Complex Problems for our Clients and Our Nation

Federal agencies call on Noblis when they need insight, inspiration and innovation. As a leading provider of scientific and technology solutions and expertise, Noblis discovers opportunities and leverages similarities, differences and interdependencies across domains on behalf of our clients. We offer a host of HPC-oriented services across the federal market including:

- HPC infrastructure, architecture and engineering expertise
- Analytic toolset evaluation, selection, development and operations
- Data architecture design and deployment
- Extensive consulting expertise across the data sciences including computer vision, neural networks and other AI domains

Adopting Responsible AI Capabilities Using HPC

Our Artificial Intelligence Research and Innovation Center and ML Lab focus on moving prototypes out of research and into the field to solve real problems in novel ways. Noblis' goals are to:

- Help develop AI/ML applications across the U.S. government
- Train the next generation of data scientists
- Promote interoperability of HPC architectures and middleware and enhance access to legacy systems and data
- Ensure AI-oriented solutions are adopted in a responsible, secure manner
- Partner with small businesses and universities to innovate using HPC capabilities
- Reduce cost barriers associated with applying HPC services to mission impact

Using Mega-Scale Graphics Processing Unit (GPU) Environments and Automation to Solve Complex Problems

Noblis employs a cutting-edge selection of compute resources to execute our research programs and those of our clients. This includes the NVIDIA DGX and A100 platforms, a scalable, massively diverse GPU processing environment that is optimized for AI workloads. This is coupled with extensive Hadoop Spark Clusters for large-scale data analysis operations. The system is designed to maximize parallel modeling operations through automation of workload distribution and resourcing. Noblis' HPC environment offers a level of computing power that is rarely found outside of federal laboratories and academic settings.

Detecting Assembled Engineered Targets

Using our HPC capbilities Noblis experts developed an Integrated Multiplatform Analysis for Genome Engineering (IMAGED) platform. This platform is a computational pipeline that rapidly detects indicators of genome engineering in biological systems using a combined HPC Beowulf style grid and large compute nodes. Using IMAGED we are able to detect an assembled engineered target within one hour.

Recovering Passwords Using GPUs

Law enforcement uses case-specific data to recover passwords by extraction and then create similar passwords via extrapolation. This process is often run on massive datasets by partitioning workloads across tens, or even hundreds, of CPU nodes.

At Noblis our experts are able to run these workloads on GPUs, allowing for results in the same timeframe, but with better performance and power efficiency, resulting in cost-saving benefits for our clients.

Developing AI Alternatives to Deep Learning Approaches

Noblis is researching natural selection mechanisms to develop possible AI alternatives to existing Deep Learning (DL) approaches. Our principal innovation is a unique implementation for mutating code across our GPU environment to produce open-ended and explainable solutions beyond the current state of DL art. Applications include optimization techniques, econometrics approximations, model-based learning for predictive needs and image recognition.

ABOUT NOBLIS

For more than 25 years, Noblis has been an innovator within the federal government, committed to enriching lives and making our nation safer while investing in the missions of tomorrow. As a nonprofit, Noblis works for the public good, bringing together the best possible combination of science, technology and engineering expertise and solutions, in an environment of independence and objectivity to deliver enduring impact on federal missions. Together with our subsidiaries, we work with a wide range of government clients in the defense, homeland security, intelligence, law enforcement and federal civil sectors.

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