



ARGONNE SPINOUT COMPANY PARALLEL WORKS SPEEDS DESIGN WITH INNOVATIVE COMPUTING TECHNOLOGY

THE CHALLENGE

The genius behind the design of many things—cars, airplanes, innovative drugs, transportation systems, energy systems—is modeling.

These simulations, which are driven by big data and analytics and incorporate many design parameters, are computationally intensive, time consuming, and often very expensive. Scientists trying to solve complex problems and engineers working to design innovative new products and services are always looking to run the computing tasks behind their models in ways that are faster and more cost-effective.

THE INNOVATION

To speed up the development of advanced models, researchers at U.S. Department of Energy's Argonne National Laboratory and the University of Chicago (UChicago) developed Swift, a simple scripting language and system for executing large-scale science and engineering computation within a short amount of time.

Swift automates the hard work of doing computational workflow on supercomputers, the cloud and other distributed and parallel computing platforms. It enables the concise, high-level specifications of complex parallel computations, allowing a user to execute simulation campaigns in tandem across multiple high-performance computing (HPC) and cloud resources. Swift users from the realms of research and industry have seen exponential savings in program development and execution time.

ABOUT PARALLEL WORKS

Swift, Argonne and UChicago Computation Institute computer scientist Michael Wilde co-founded Parallel Works, Inc. Built upon the foundation of Swift, Parallel Works delivers a next-generation technical computing platform for engineers and scientists to easily scale simulation and modeling workflows across HPC systems in the cloud.

THE IMPACT

Parallel Works licensed the Argonne-developed machine learning-genetic algorithm (ML-GA):

- Speeds up virtual prototyping and product development
- Applications span automotive engine and heavy equipment design, consumer goods packaging, and hydrological engineering.
- Recognition includes an R&D 100 award, the 2022 Federal Laboratory Consortium's National Award, and \$750,000 from the U.S. Department of Energy's Vehicle Technologies Office

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