

Scalable Cyberinfrastructure for Artificial Intelligence and Likelihood-Free Inference



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What is Artificial Intelligence?

Systems that make decisions usually requiring a human level of expertise, possessing the qualities of intentionality, intelligence and adaptability (*definitions vary*)

What is Likelihood-Free Inference?

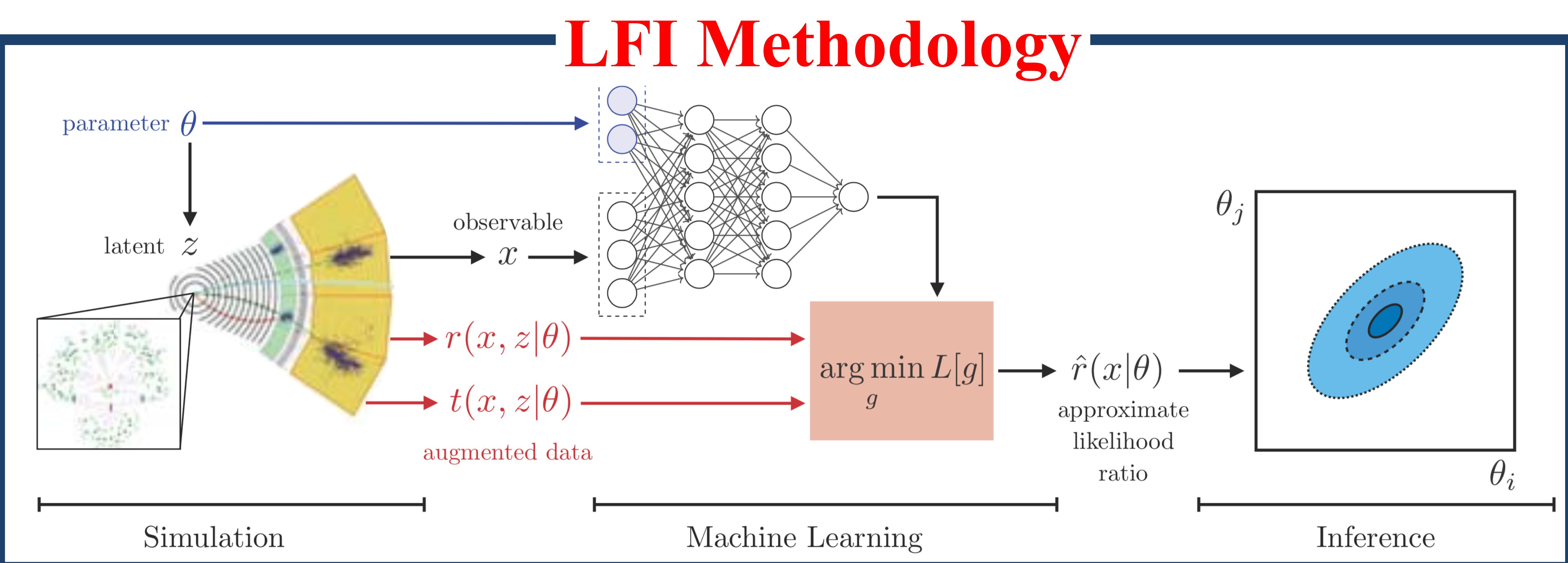
Methods used to constrain parameters of a model by finding the values which yield simulated data that closely resembles the observed data
(*definitions vary*)

Science Driver

Analysis of data from the Large Hadron Collider is the primary science driver, yet the technology is sufficiently generic to be applicable to other scientific efforts

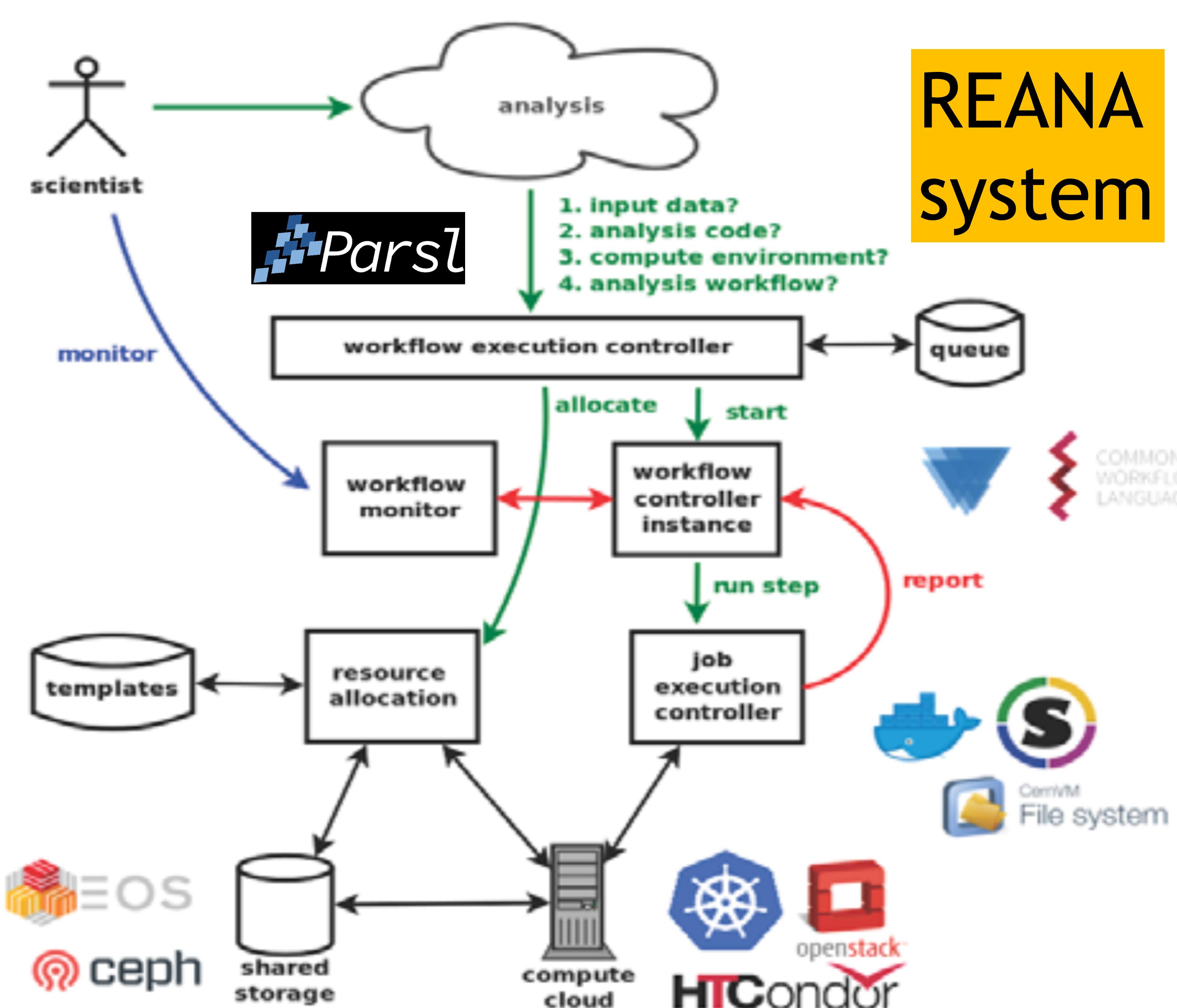
Main Goal

Deploy AI and LFI methods and software using scalable cyberinfrastructure to be integrated into existing CI elements, such as the REANA system, to increase the discovery reach of data-intensive science



Catalyzing Convergent Research

- The abstract LFI problem formulation has been demonstrated as the *lingua franca* for a diverse range of scientific problems
- Current tools for many tasks are limited by a lack of scalability for data-intensive problems with computationally-intensive simulators
- Tools will be designed to be scalable and immediately deployable on a diverse set of computing resources, including HPCs
- Integrating common workflow languages to drive an optimization of ML components and to orchestrate large-scale workflows lowers the barrier-to-entry for researchers from other science domains



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