DeepSim

Scalable AI based controller design and optimization platform

DeepSim automates manual processes in your existing design and optimization workflow, by allowing subject matter experts to guide A.I. algorithms (based on Reinforcement Learning). DeepSim integrates with simulators you already use to optimize results without painstaking manual heuristic design. This automation delivers superior performance and faster time to market by exploring enormous parameter spaces faster than humanly possible.

DeepSim is powered by a scalable cloud platform, giving you fast response times even when scaling up your problem. With the ability to test and validate solutions, and to fine-tune the controllers via real-world input (and hardware in the loop options), you can overcome sim2real problems with ease. Patent pending technology based on novel A.I. methods for hardware and runtime selection makes the platform cost effective and reduces the overall development cost.

The DeepSim platform generates controller software, which is optimized for the final deployment platform to ensure all the relevant deployment KPIs such as latency, throughput and energy use are met. It also ensures the following:

Faster time to market: DeepSim leverages your subject matter expertise to automate the design and optimization process. Through a continual feedback process your processes will keep improving over time, becoming more versatile and as such extending the lifetime of deployment platforms.

Better performance: Modern controllers accept far greater numbers of parameters than what can be explored by manual optimization. DeepSim overcomes this complexity limit with powerful algorithms, efficient scalability, and optimization for CPU and GPU hardware.

Scalability: DeepSim is built upon the powerful Azure Cloud and has access to a nearly unlimited pool of computational resources, including special purpose hardware resources such as GPUs. This allows DeepSim to scale beyond what is possible on your local workstation or in-house cluster, allowing you to run more complex applications faster.

Cost awareness: DeepSim helps you to keep your cost under control by dynamic license allocation, efficient and cost efficient SKU selection and minimization of allocated compute resources. With our patent pending technology (16/278699), you will always train a suitable controller at minimum cost.

Broad applicability:
- **Controllers**: The DeepSim platform can be applied to generate or optimize controllers for static and dynamical processes in any vertical. This can include dynamical systems in automotive (vehicle dynamics, battery optimization, steering control, etc.), green energy (wind turbines, solar panels, hydroelectricity, etc.), or the autonomous vehicle (path planning, stability, agriculture, etc) industries.

- **Optimization processes**: DeepSim helps operators in their decision-making process by coming up with novel solutions and settings. You can apply DeepSim to increase the throughput of your manufacturing pipeline, or to optimize the control parameters and placement of your wind farm.

Safety: When putting machines in charge safety is always a concern, but DeepSim helps you manage this concern with the DeepSim Safety Certification tool. This tool provides a means of safety verification at a human-interpretable high-level, gives a notion of the effective operational (design) domain and gives a quantitative risk assessment of the quality of the coverage of that domain.

Privacy & security: DeepSim is installed within your Azure subscription, giving you full control over your data, simulators, and resource usage. You can specify who gets access to the DeepSim platform, control the type of machines used and how the data is stored. There are no dependencies on the outside world, everything is self-contained giving you full control.