Integer Gate Logic (IGL) Neural Networks

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The Problem: AI Systems are Expensive and Slow

High Energy Consumption. Expensive.

High Complexity. Slow.

High Capital Investment. Unnecessary.

The Solution: Integer Gate Logic (IGL)

Power Efficient. Uses 50% less power.

Computationally Efficient: Uses 75% less memory.

CapEx Efficient: Uses simple controllers.

How IGL Works

Intelligent Nodes reduce network size, parameter counts and computational load.

Patented Algorithm provides faster performance with simple, integer based math.

True Parallel Processing eliminates bottlenecks.

Detecting Handwritten Digits from 0 to 9

Image Detection Test Results

State-of-the-Art AI System Accuracy:

98.36%

Digit	% Correct
0	98.98
1	99.15
2	99.35
3	95.45
4	99.30
5	95.15
6	97.58
7	98.92
8	97.76
9	98.91
Average	98.36

Pytorch Model using backpropagation with 37.908 kilobytes of 4 byte (32-bit) floating point parameters.

IGL Accuracy:

99.91%

Digit	% Correct
0	99.58
1	99.53
2	99.48
3	99.06
4	99.86
5	99.03
6	98.18
7	99.67
8	98.27
9	99.27
Average	99.19

IGL with 9.537 kilobytes of 1 byte (8-bit) integer parameters. 4X smaller, faster.

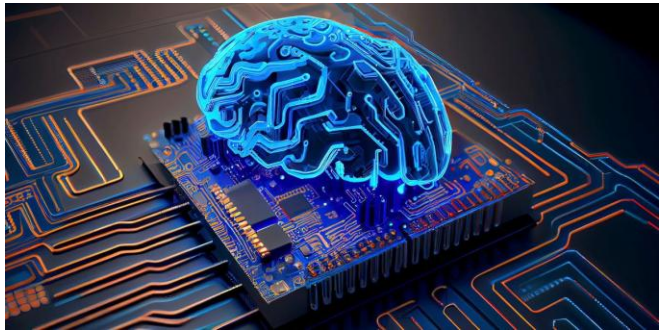
*MNIST Modified Noisy Data Set; 70,000 samples

Applications

IGL Networks can be used as the base foundational model in every size AI application:

- Plug-in to existing LLMs and generative AI systems
- Edge AI Environments
- Microcontroller environments (TinyML)

TinyML



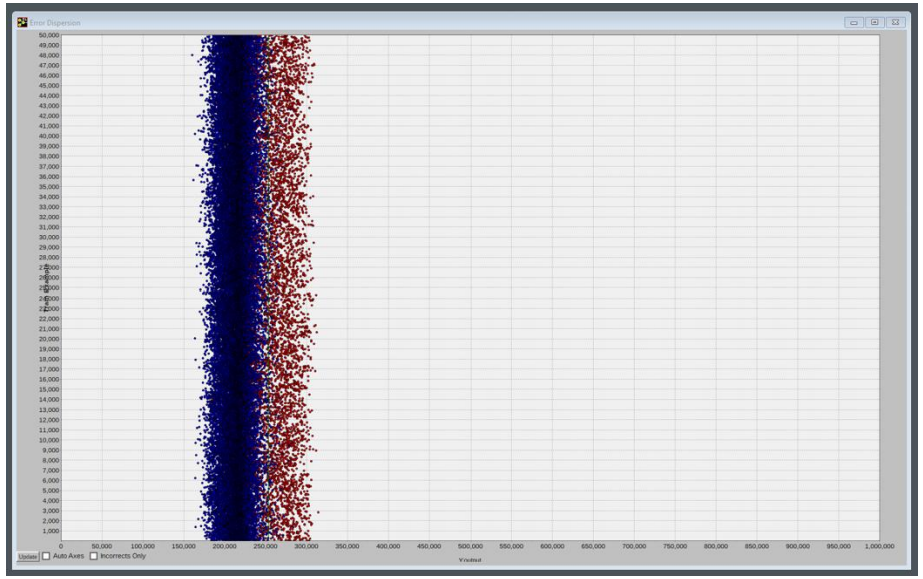
IGL Networks are particularly suitable for sensor-based microcontroller environments.

The model can be sized, trained and output as code for loading into a microcontroller for fast, accurate operation.

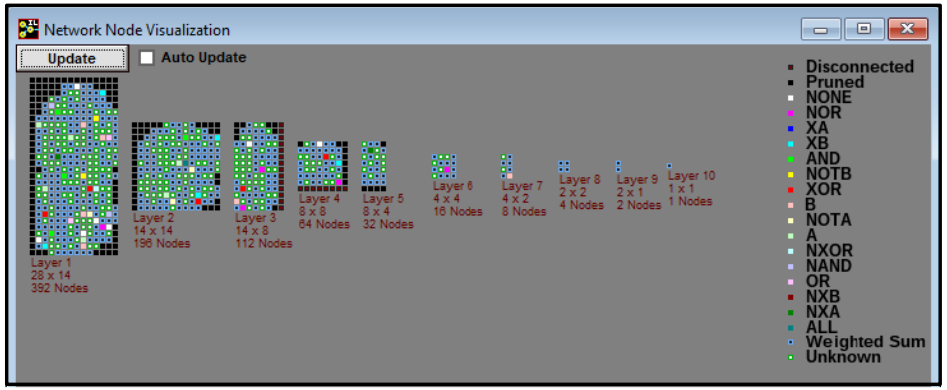
IGL Networks are robust and accurate in noisy environments.

CUDA Language Library – IGL works on every NVIDIA GCU

A GPU-based CUDA language processing module utilizes all available processors (100% utilization rate) in the GPU to evaluate and select +20 million parameter values per second

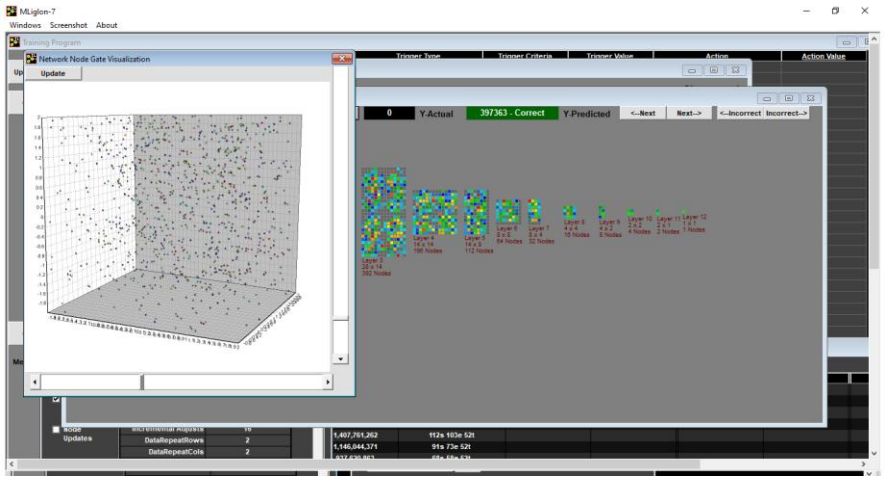


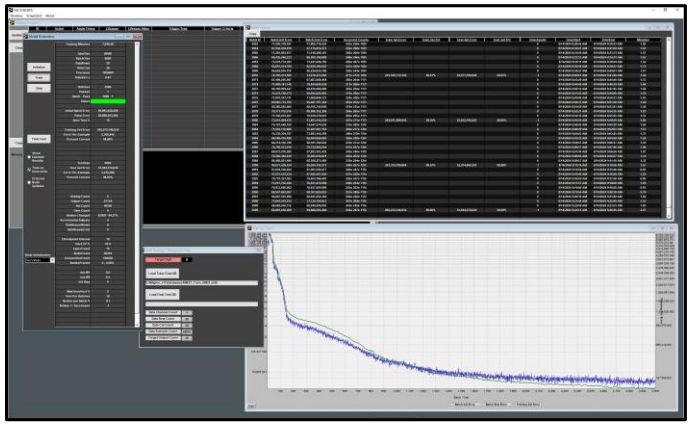
Internal Visualization



IGL provides a visualization software platform solution that enables users to configure, train and use an IGL model.

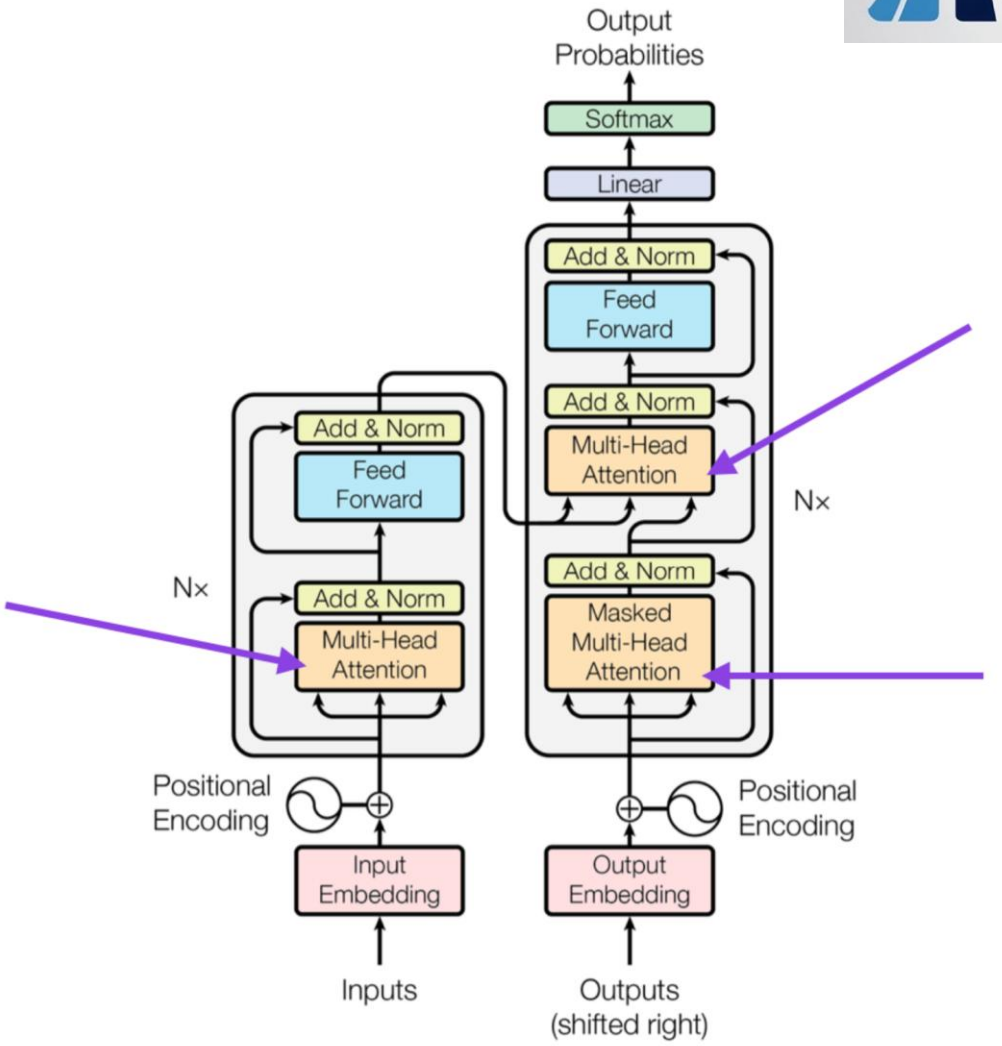
The platform provides real-time visualization of node configurations and actuation during training and use.





IGL Attention Head Plug-In

IGL based multi-head attention layers and heads can be added to existing transformers (LLMs, etc.).



Source: "Attention Is All You Need" (https://arxiv.org/abs/1706.03762)

Opportunities

- Edge AI and Tiny ML microcontroller applications
- Licensing of IGL patent portfolio and tech to large model sources (software) and semiconductor fabs (hardware)
- A CUDA GPU library has been developed and can be deployed as a subscription-based resource
- Development of Next Gen Foundation (LLM) and Generative AI Models and Applications

Meet the IGL Team

Michael J. Pelosi, Founder and CEO

Michael P. is an educator, researcher, inventor and entrepreneur. He founded Maui Solar Energy Software Corporation, and holds patents in several technical areas. His research collaborations over the past 30 years include NIST, Sandia National Labs, and DARPA. He has taught at numerous U.S. universities, is a Divinci Award recipient, and holds a Ph.D. in Comp. Sci.

Michael S. Brown, VP of Software Development

Michael B is also an educator, researcher, inventor and entrepreneur. He founded Valhalla Data Systems, and was a director at Sun Microsystems, Forte Software, and iPlanet. Michael B has over 30 years of experience in industry and academia, is a Fulbright recipient, and holds a Ph.D in Comp. Sci.

Randall K. McCarthy, Outside General Counsel

Randy is a U.S. patent attorney with over 30 years of experience in machine learning, controller, network and computer systems for startups and Fortune 500 companies.

IGL: SHAPING THE FUTURE OF AI

- IGL is the first new foundational architecture in 50+ years
- IGL addresses all the most pressing AI industry needs
- For more information, visit our website https://integergatelogic.ai or contact:

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