

Neutero: Neural Network based Image Inferring on Heterogeneous Hardware

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Some terminology

90's Media: AI WILL DESTROY THE WORLD IN A DECADE

That AI today:

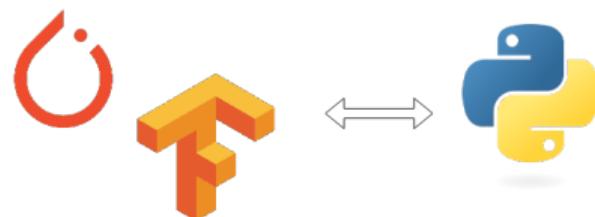


Source: pinterest.com

- Machine Learning, Neural Network and Image Recognition
 - What is Image Inference?
 - What we mean by “Heterogeneous Hardware”?

Problem 1

Different hardware require different frameworks, different frameworks use different programming languages.



(Partial) Solution to Problem 1

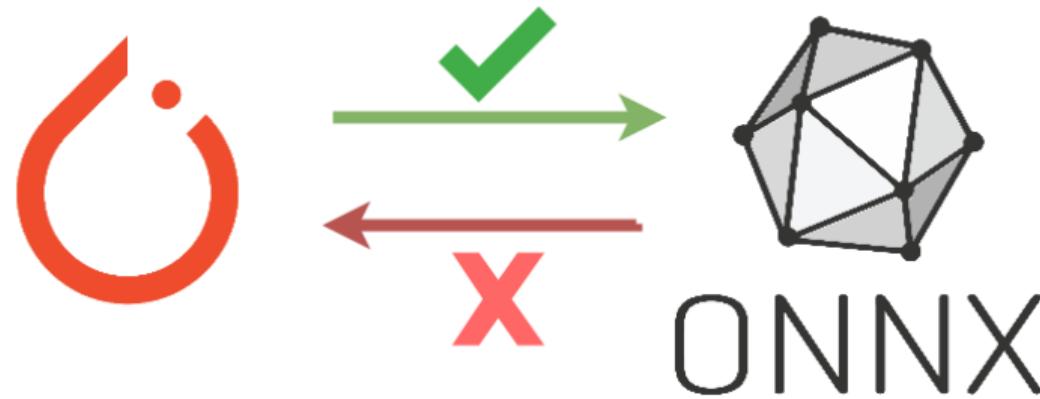


Source: opensourceforu.com

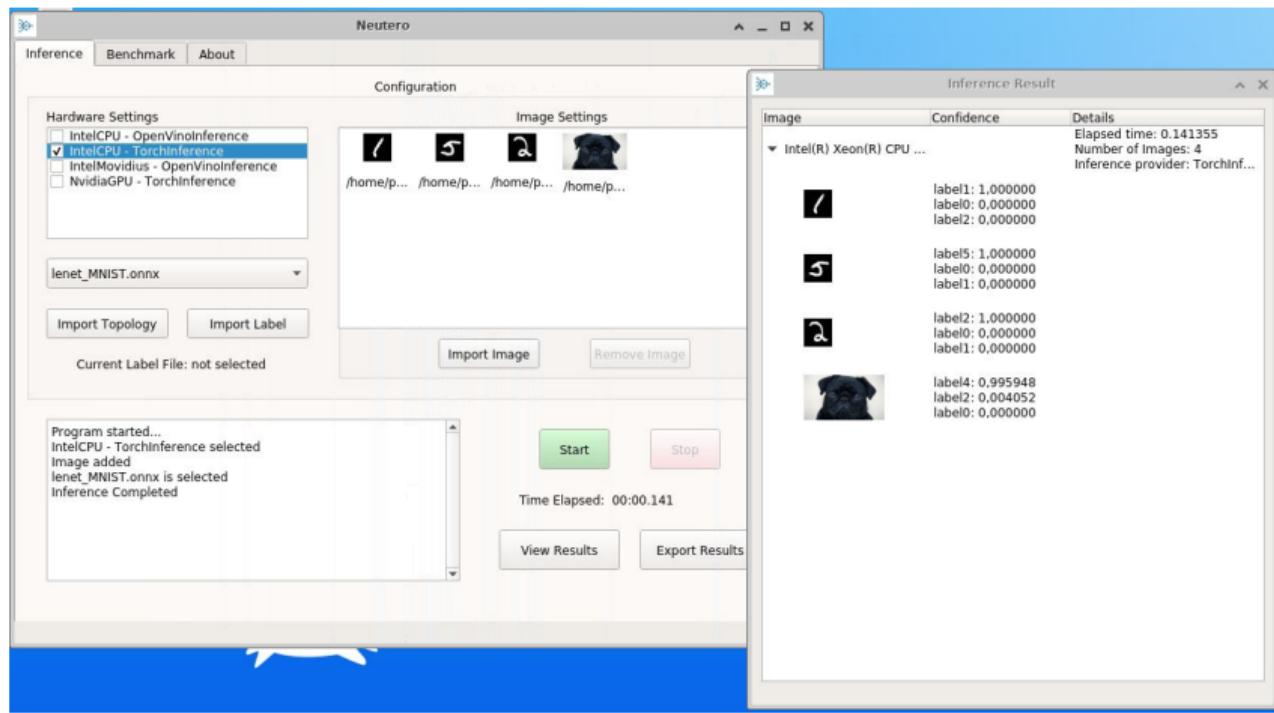
ONNX: Open Neural Network eXchange



Problem 2



Our Solution: Neutero



Who are we?

- **Rodi & Oğuz:** Back-end (Model) development
- **Yavuz:** Front-end (View) development
- **Li:** Testing, documentation, environment management
- **Umut:** Controller development, deployment

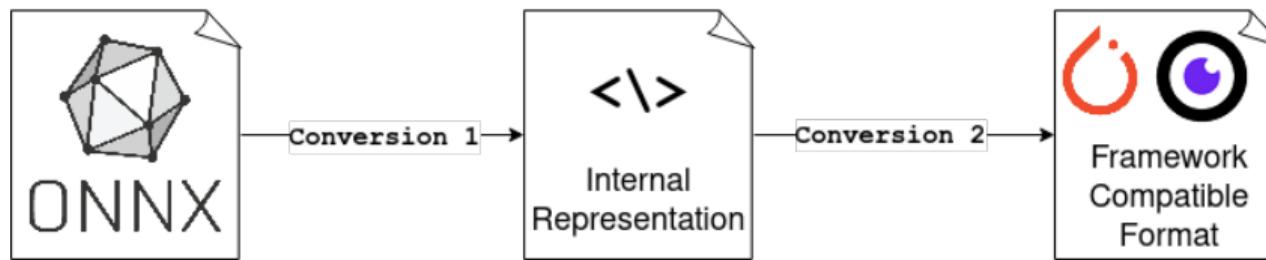
Demonstration

See our program in action!

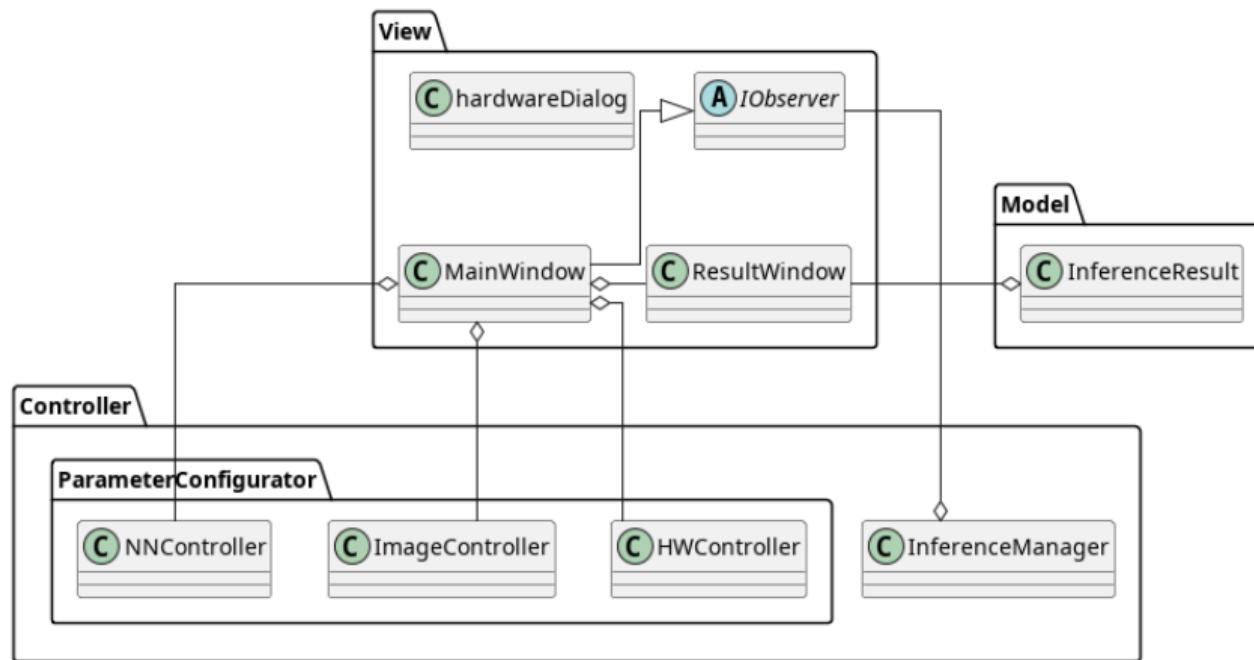
Tools we used

- C++
- Qt, Qt Creator
- ONNX
- qmake, make, gcc
- lcov, gcov

Inner Details (1)



Inner Details (2)



Some statistics

Main Project: 4416 lines (364 of them are comments)

Test Project: 890 non-comment lines

Total LOC: 5306 lines, 4942 non-comment lines

Total commits: 335 commits in 15 branches.

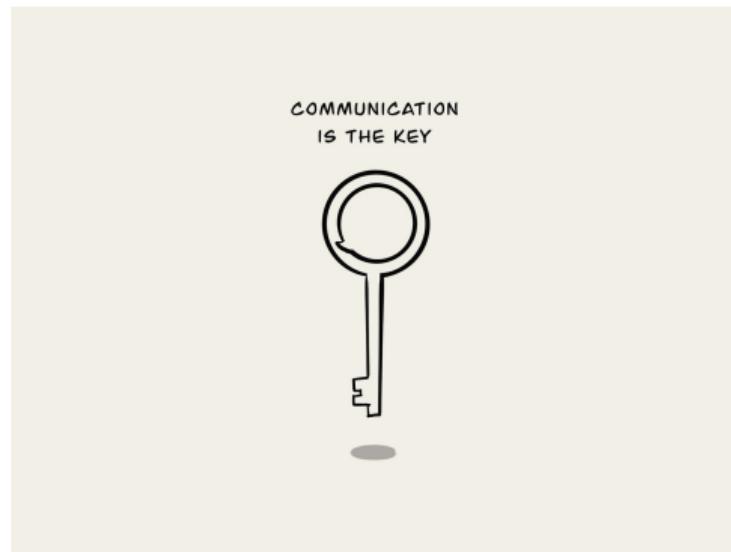
Unit Test Coverage Summary

	Line	Function
Model	92.0%	92.8%
Controller	83.6%	82.6%
Total	90.0%	90.1%

Waterfall Model & Implementation Details

- Cautious planning in the Specification Phase
 - Simple requirements
 - Robust design
- Learning curve of C++ and Neural Networks are steep

Teamwork & Organization



Artist: "akkicha" at dribble.com

Acknowledgements & License

Our project is available on GitHub under GPL v3 License.

Many thanks to our advisors Soyed Tuhin Ahmed and Christopher Münch.

The End

Thank you for your attention!