

Neutrino Weekly Status

Sean Gasiorowski

On behalf of the neutrino ML team

March 16th, 2022



U.S. DEPARTMENT OF
ENERGY

Stanford
University

SLAC NATIONAL
ACCELERATOR
LABORATORY

Broad areas of work

- Debugging (differentiable TPC sim)
- Results: parameters and metrics (differentiable TPC sim)
- Speed/performance (differentiable TPC sim)
- Inverse solver
- SIREN PMT

- Discussion last week: gradient flow issues (?)
 - Noticed this week seems to be a problem for e.g. long_diff as well as vdrift
 - Sean is checking into this piece by piece (swapping in arange with something differentiable, find if other spots where flow breaks)
- Discussions with Yifan:
 - Lifetime, Ab/kb, diffusion constants probably the most important to demo

Results: parameters and metrics

- Discussion last week:
 - Goal is to demo automated procedure, not necessarily do better
 - Can do independent lifetime fit, e.g., if we do want a baseline
 - Can make tolerance statement in two ways
 - Comparing loss with/without noise
 - What is the parameter range where the output is indistinguishable?
 - Do we recover the target parameters?

- Code is being de-notebookified (Sean/Yifan/Youssef)
- Youssef is working on multi-GPU setup
 - Should make it more feasible to run with larger batches
- Yifan has an open PR for some target setup, is working on updated batching
 - Sean and Youssef need to review PR
 - Yifan should push things if help is needed!

- Presentation today (?) from Kazu with data setup
- First step: train discriminative model
 - Gives a baseline that we can discuss with Stefano Ermon's group (re: uncertainties, etc)

- Statement last week: make draft for comments available
 - Is this ready?