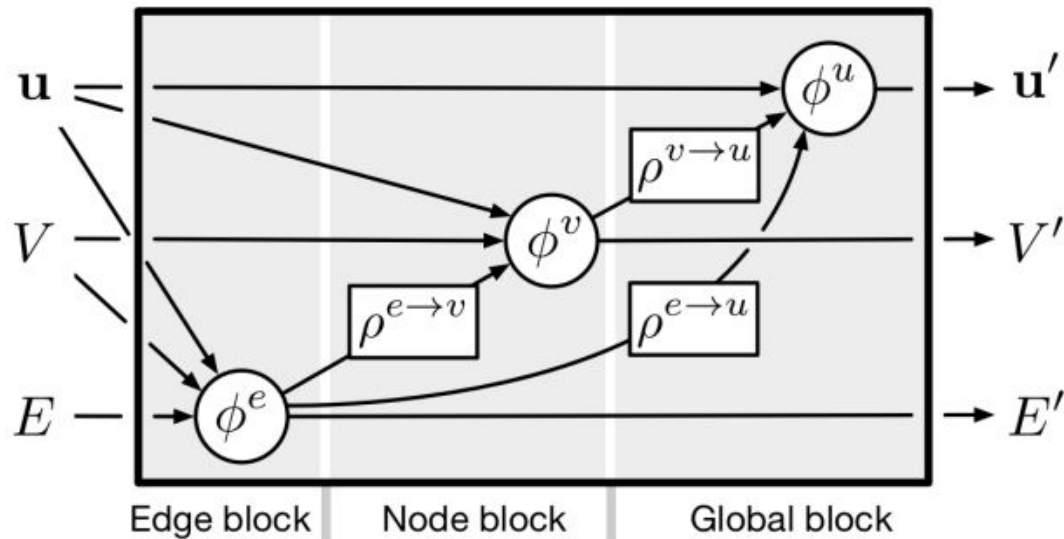


Graph nets in TMVA

Stanislav Lukyanenko, GSOC '20

Block design

- Do-nothing update and aggregate functions if we don't need to change
- Gradients are calculated in the reverse order



GNN Block

GNNUpdater - a wrapper class around TDeepNet modified to return the gradients during the backward pass

Takes and outputs graphs

(or vectors of tensors)

Flattens and concatenates features depending on the implementation

```
template <typename Architecture_t>
class TGNNBlock : public VGeneralLayer<Architecture_t> {
public:

    using Tensor_t = typename Architecture_t::Tensor_t;
    using Matrix_t = typename Architecture_t::Matrix_t;
    using Scalar_t = typename Architecture_t::Scalar_t;

private:

    EdgeGNNUpdater <Architecture_t>  edge_updater;
    NodeGNNUpdater <Architecture_t>  node_updater;
    GlobalGNNUpdater <Architecture_t> global_updater;
    EdgeGNNAggregator <Architecture_t> edge_aggregator;
    EPVGNNAggregator <Architecture_t> edge_per_vertice_aggregator;
    VerticeGNNAggregator <Architecture_t> vertice_aggregator;
```