

USENIX ATC'19 Lightning Talk, Renton, WA, USA

# NeuGraph:

*Parallel Deep Neural Network Computation on Large Graphs*

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Self-Driving



Personal Assistant

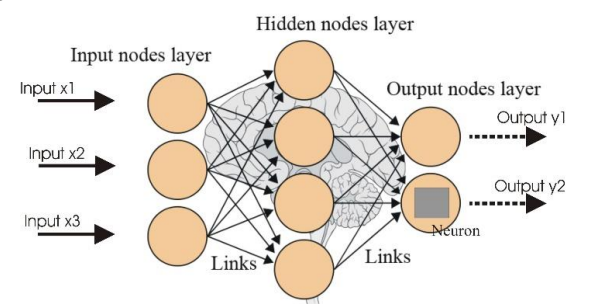
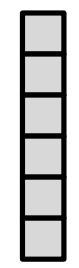


Recommendation



Question Answering

Input Feature Vector



## Neural Networks

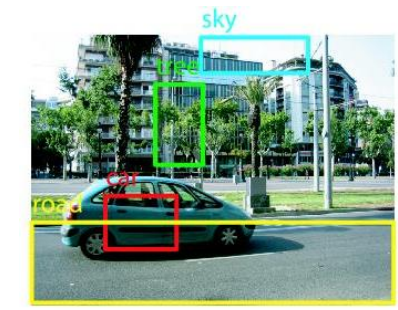
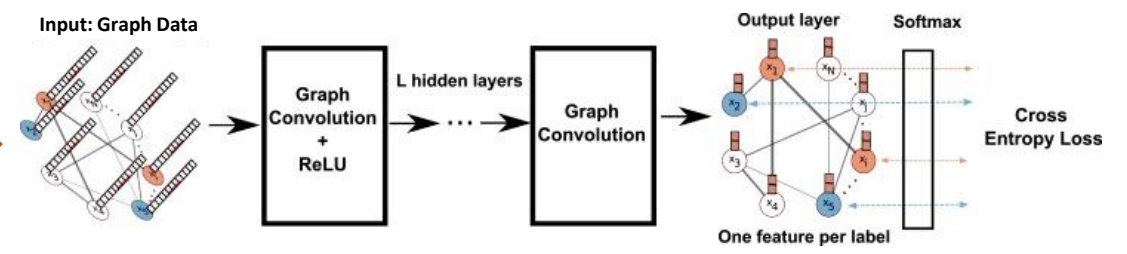


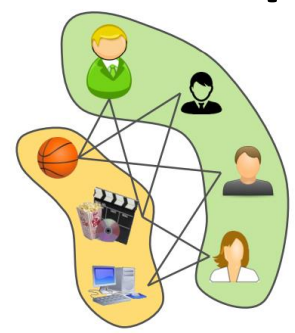
Image Object Detection



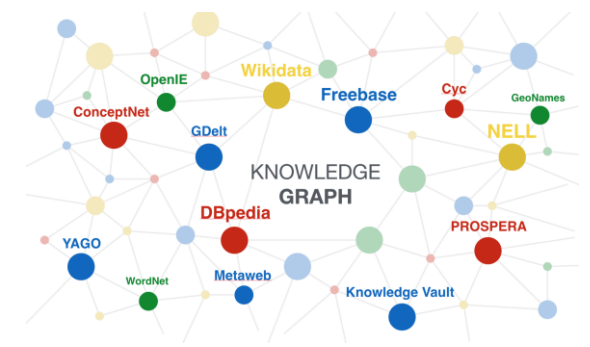
Speech Recognition



## Graph Neural Networks



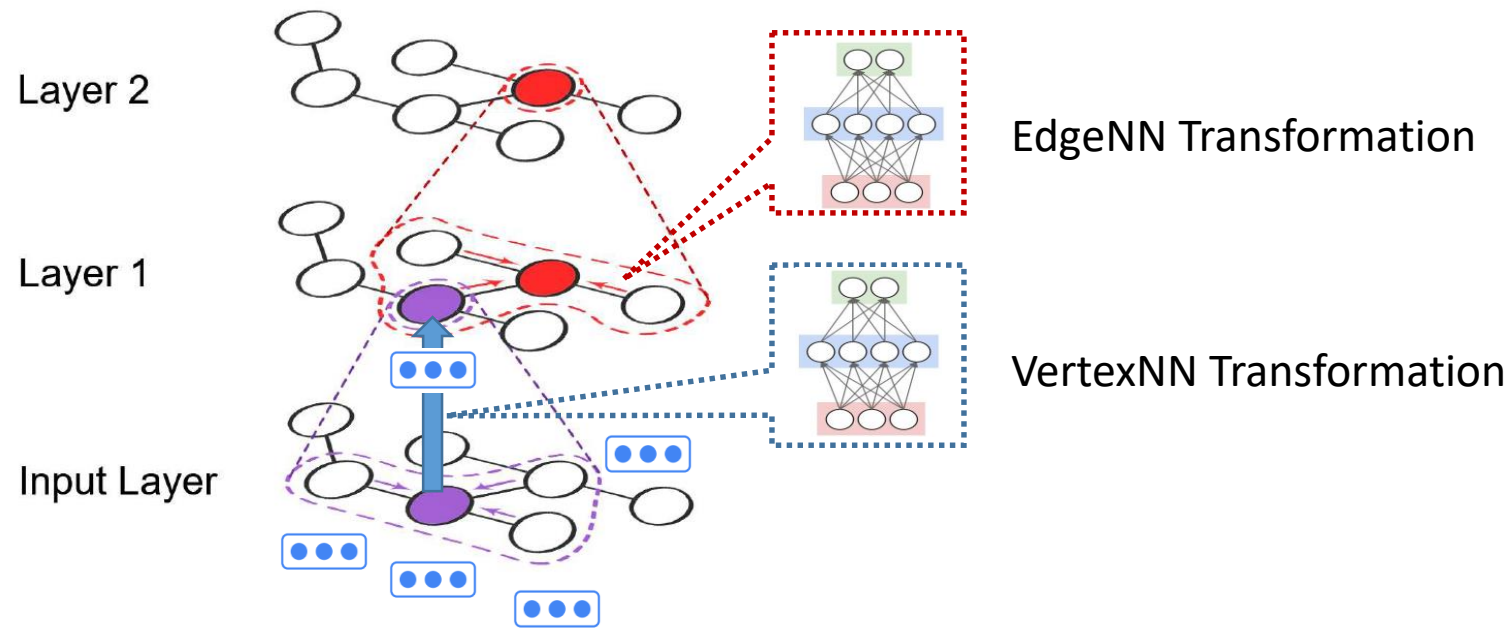
User-Item Graph



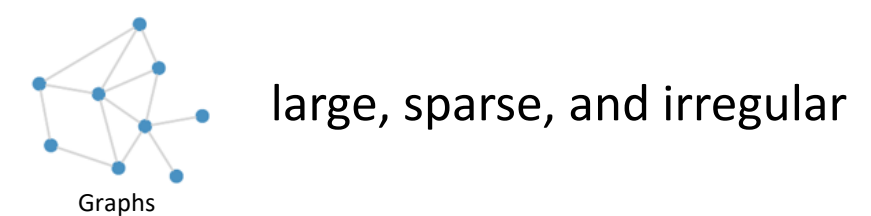
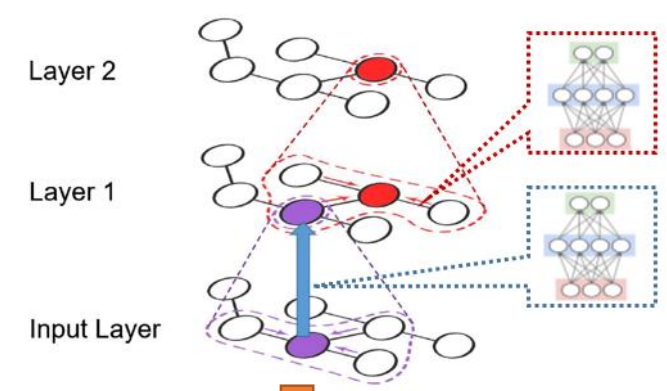
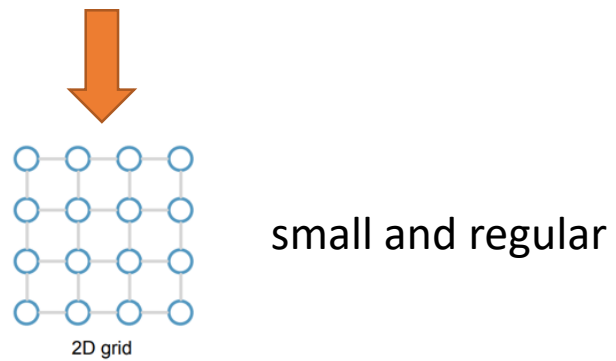
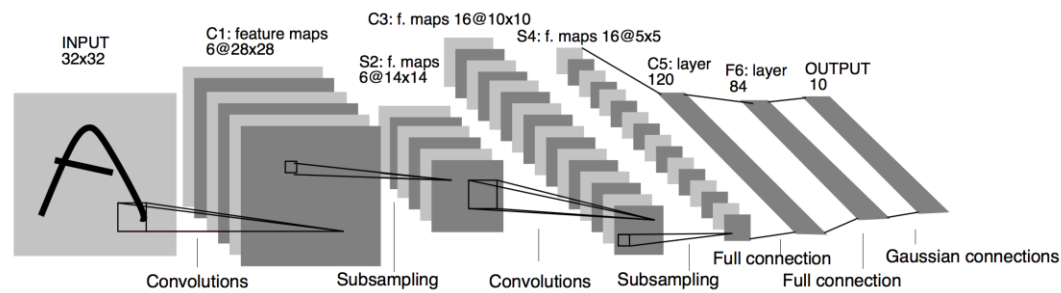
Knowledge Graph

# Graph Neural Networks (GNN)

- Information propagation via *Graph*
- Information transformation via *Neural Networks*

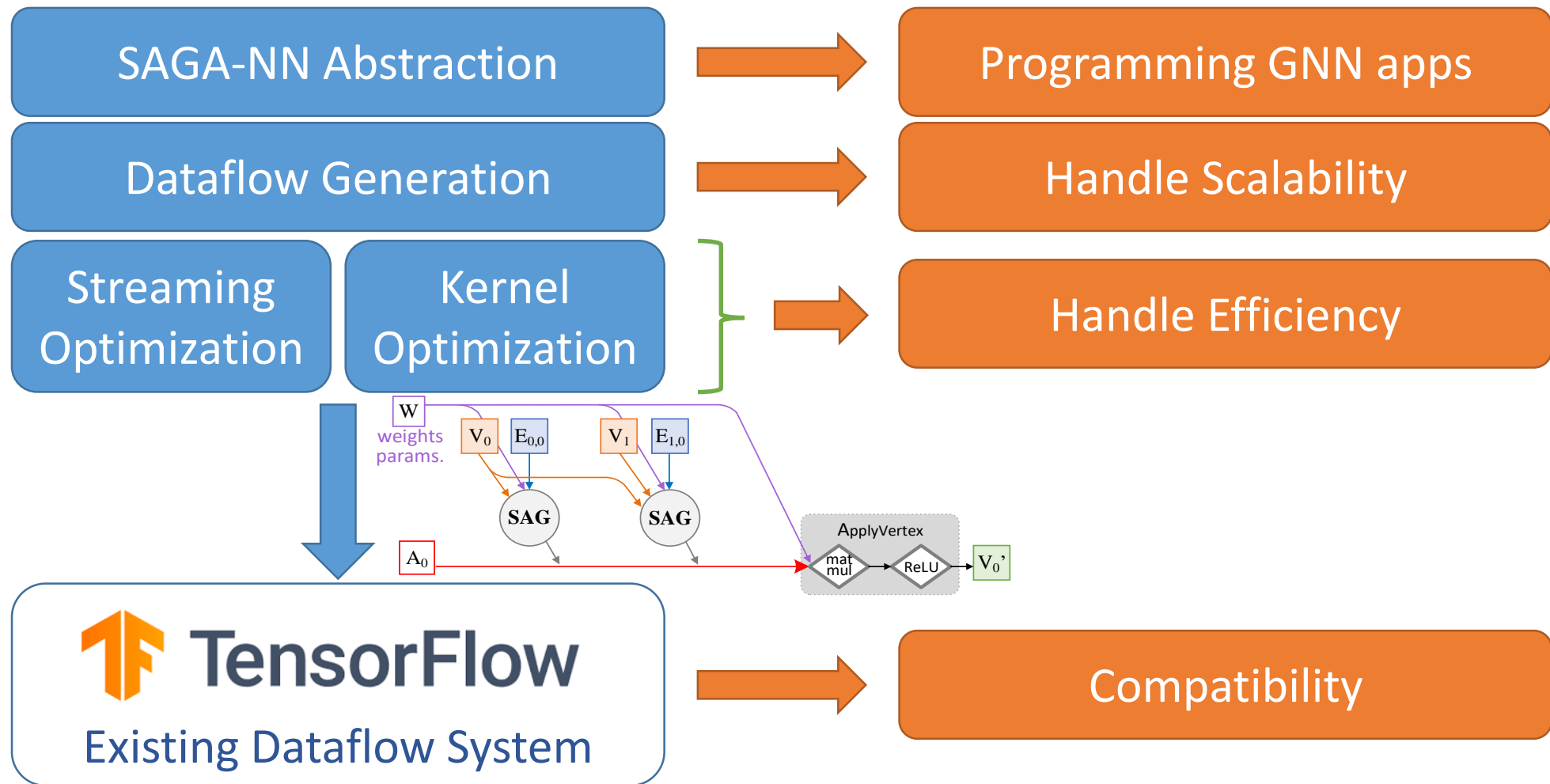


# Challenges in Processing GNNs



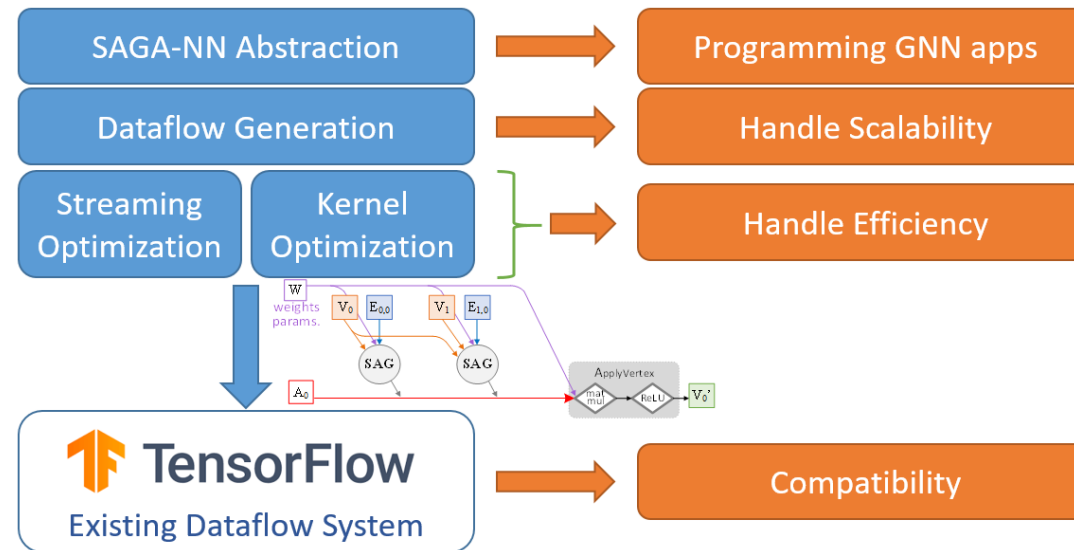
# NeuGraph

- Bridge graph and dataflow models to support efficient and scalable GNN processing



# NeuGraph

- Bridge graph and dataflow models to support efficient and scalable GNN processing



## - Performance

- Outperform state-of-the-art frameworks (e.g., TensorFlow and DGL) on small graphs
- Scale to large real-world graphs with GPUs

*NeuGraph*

2019 USENIX Annual Technical Conference  
Track II: Graph Processing Frameworks

11:55 AM-12:15 PM, on July 11<sup>th</sup>



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