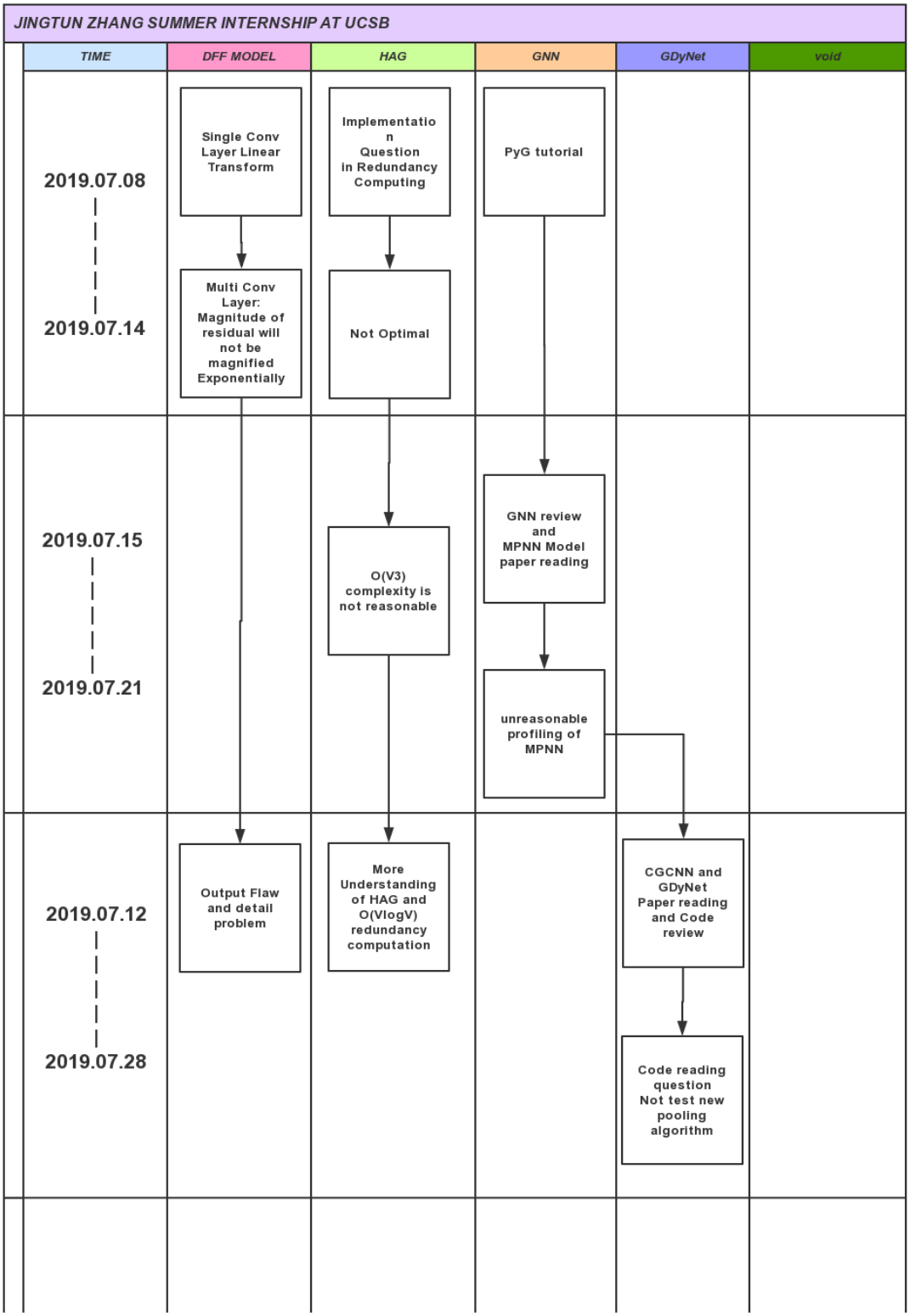
Weekly Report 2019.07.22-2019.07.28

> Jingtun ZHANG

WHERE WE ARE:



Work and Progress

1. Reimplementation of HAG:

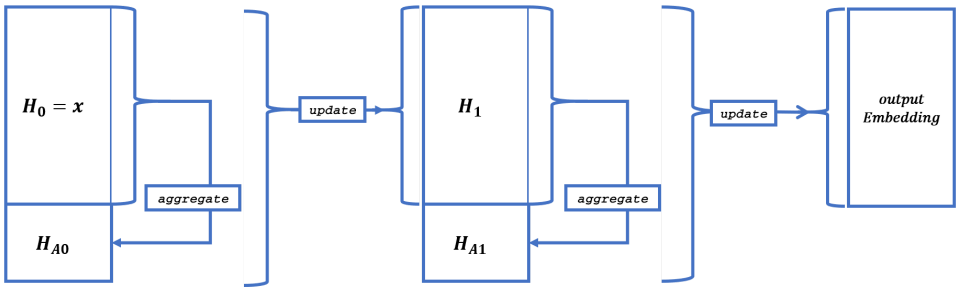
    1. Understanding of the model:

$H'^{(k+1)} = A_u A_{aggr} H'^{(k)}$

A_u 、A_{aggr}: Get New Topology at Preprocessing stage and use at all layers

A_{aggr}: First Phase:
compute embedding of aggregate node by Algorithm 2

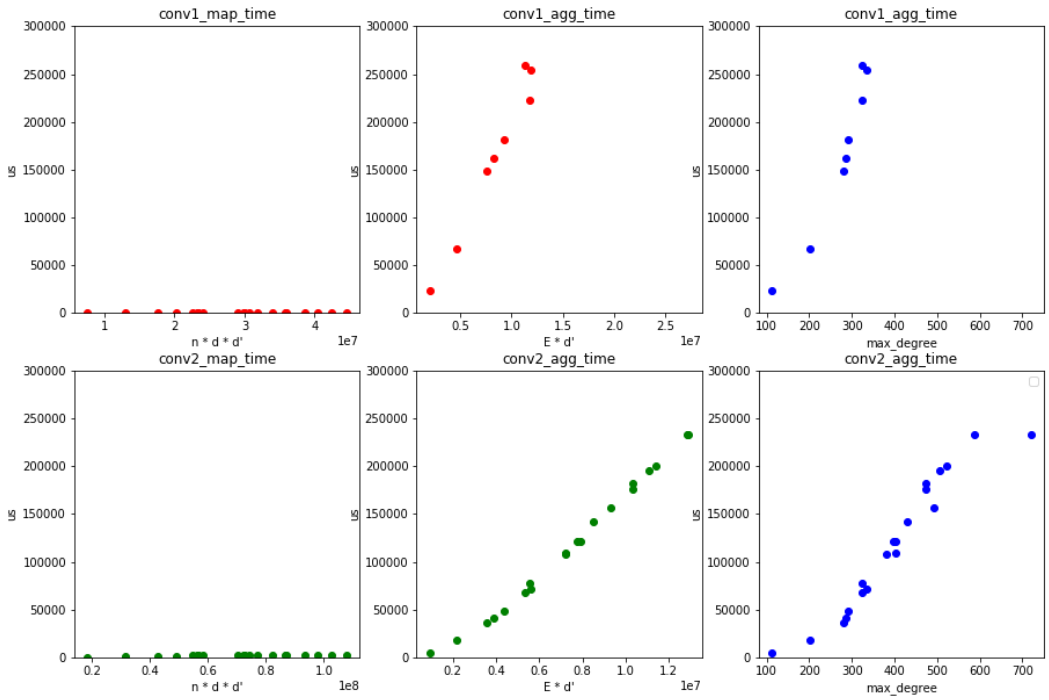
A_u: Second Phase:
compute embedding of original node in GNN model method



    2. Idea of redundancy computation: build node-pair heap every iteration in HAG building process --> O(VlogV)
    3. Coding: in coding now...

2. Reasonabe complexity analysis of MPNN network:

    1. aggregate time is proportional to Edge in the Graph: agg_time ~ O(E)
    2. aggregate time can be optimized by CUDA to graph invarient (graph with thousands of nodes)
    3. mapping time complexity --> still ubreasonable --> need profiling of **tf.matmal** procedure



3. GDyNet and CGCNN model: Test different pooling method in GDyNet

    1. Paper Reading:

        1. CGCNN: node structure --> properity --> Graph classification
        2. GDyNet: do not understand the task in detail, from model point: Markovain Process & node embedding (for traget node) --> dynamic properity of atoms

    2. Code reading:

        1. CGCNN: good pytorch code and understandable
        2. GDyNet: tensorflow.keras is not a good style --> not figure out the content of data flow and the pooling function in release code seems no pooling function

This week plan

1. give out a Good HAG Code
