Calvin Nau: Peer evaluation

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Contents

1 Title: A critical review of ml based column selection for column generation

2 Introduction

Combinoatorial optimization and ML are bidrection in relations. CO are solved directly: think min something given constraint a, b, ... Provlem is, coefficient matrix can lead to computational infeasibility. Column generation decomposes this problem. pricing problem?

Graph machine learning, traained on graph... message passing neural networks. Graph ML is trained over graph, eg message pasing nine Are there any advantages to graph ml? It is feasible for different dimension for training and test data input site.

They use CG for set-partitioning tasks, which allows you to strike a balance when adding many columns, which speeds up the oslution process. Cycling, vertices when converging to optimal solutions.

3 Critical Analysis

The paper uses mixed integer linear program to select what column to analyze. What columns should be selected? generating multiple columns, and then train over bidirectional graph: (used for transportation related problems)

4 Context

Lists papers that are related to this presentation. A deep RL framework for column generation.

5 Significance

Alternative pricing mechanism to select, avoid degernacy, allows it to be applied to other problems.

6 Methodology

Where is it published? Presenter gives broader location fo work. GNNs already validated. What is novel? Data Collection, implementation? MILP fails to converge?

Proposal for adjustment: get rid of epsilon? Self-referntial assessment, only comparing to a MILP strategy.

Relatively restricted data set. Frame GNN as opposed to zero-column selection, which is already a bad strategy!

7 Alternative approaches

Use beyond binary decsision variables

8 Proposed extensions

Transfer learning, combinatorial optimization. Adds a hypothesis to each proposed extension. Why? You are already generating such infromaion.

9 Conclusions

Give strengths and weaknesses, and seems to improve on small subset. Issue is suboptimal training strategy, testing concerns. Misrepresents results. Provides further information of ML-CO.