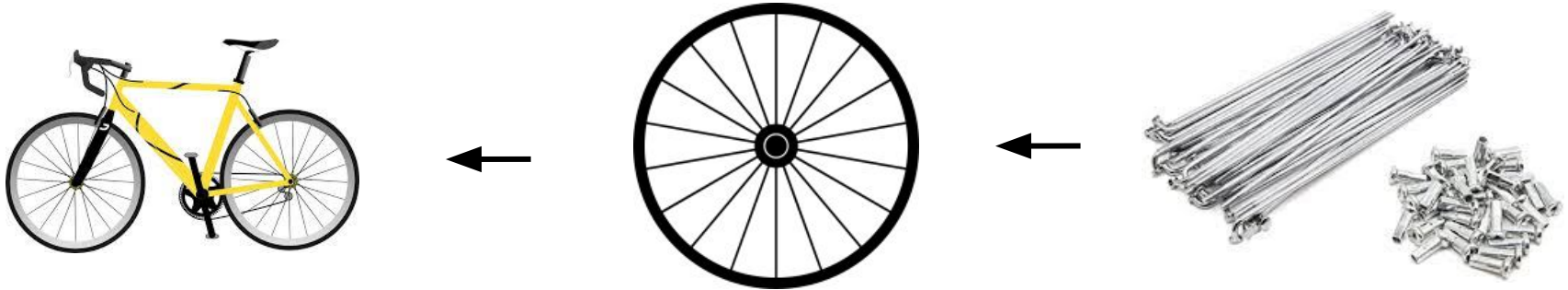


# ucod

**Underutilized COstraint Detector**  
Nikola Cucuk, Alex Trostanovsky

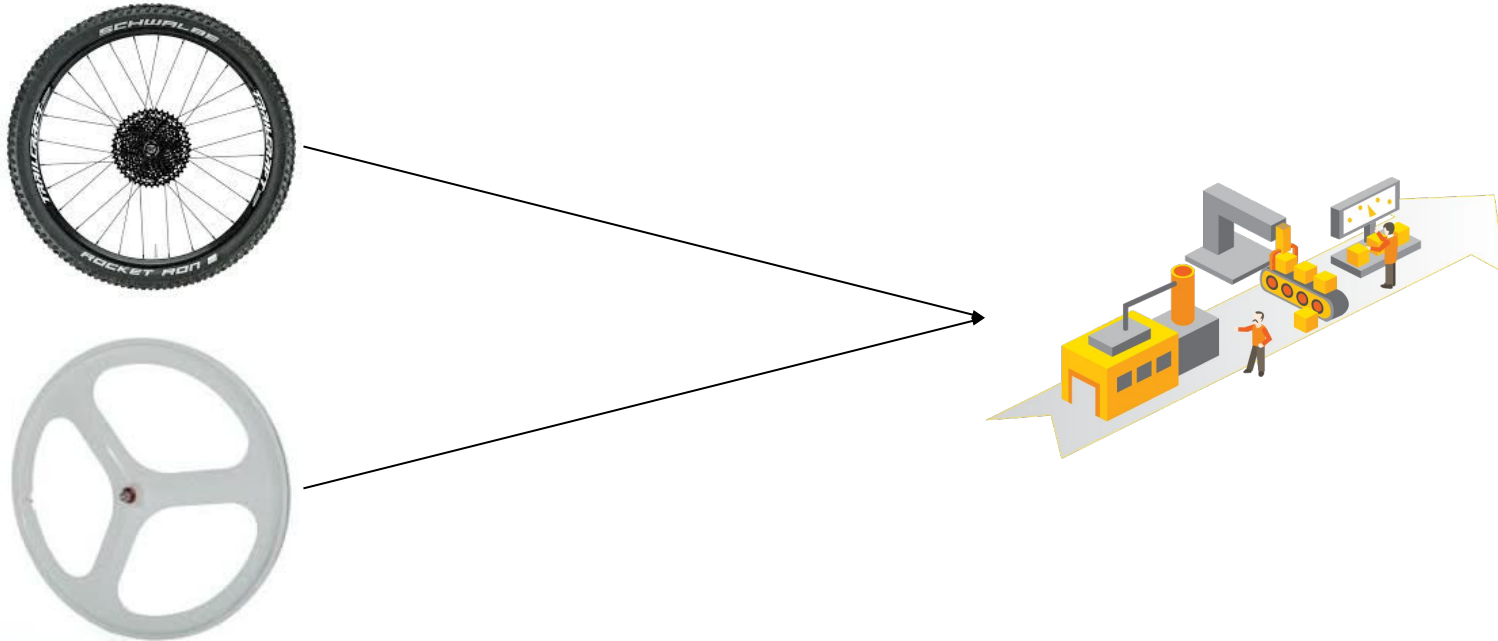
# Introduction

- In Supply Chain Management, a **Product Structure** is a complete description of how something gets made.



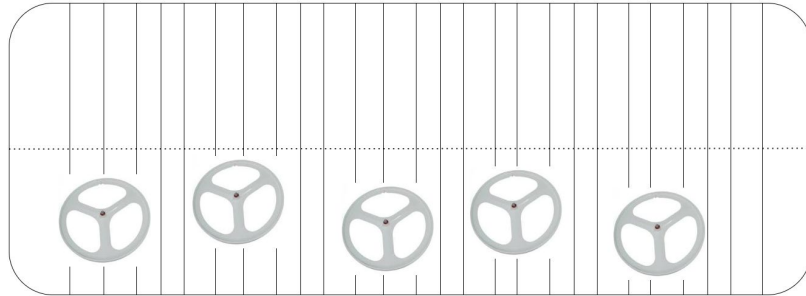
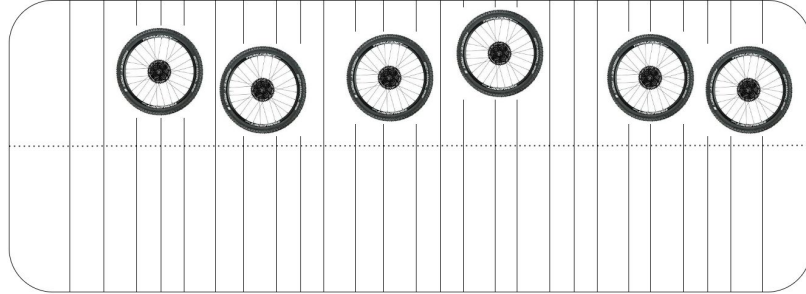
# Introduction

- A product structure also describes *Part - Constraint Dependencies*



# Underutilized Constraints in Product Structures

- Supply Chain Planners can overestimate the amount of interference in Part-Constraint dependencies



# The Underutilized COntstraint Detector

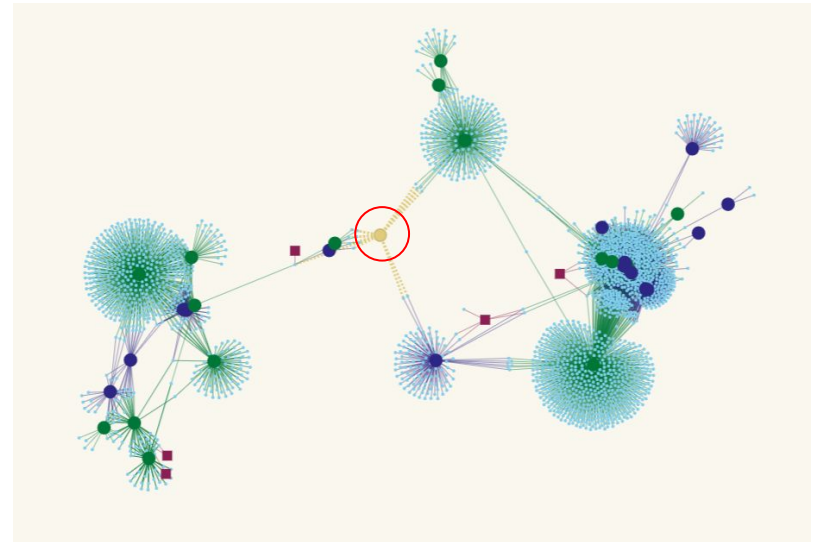
ucod allows supply chain planners to:

1. Visualize the topology of their product structures
2. Detect underutilized constraints in their product structures

# Why Vis?

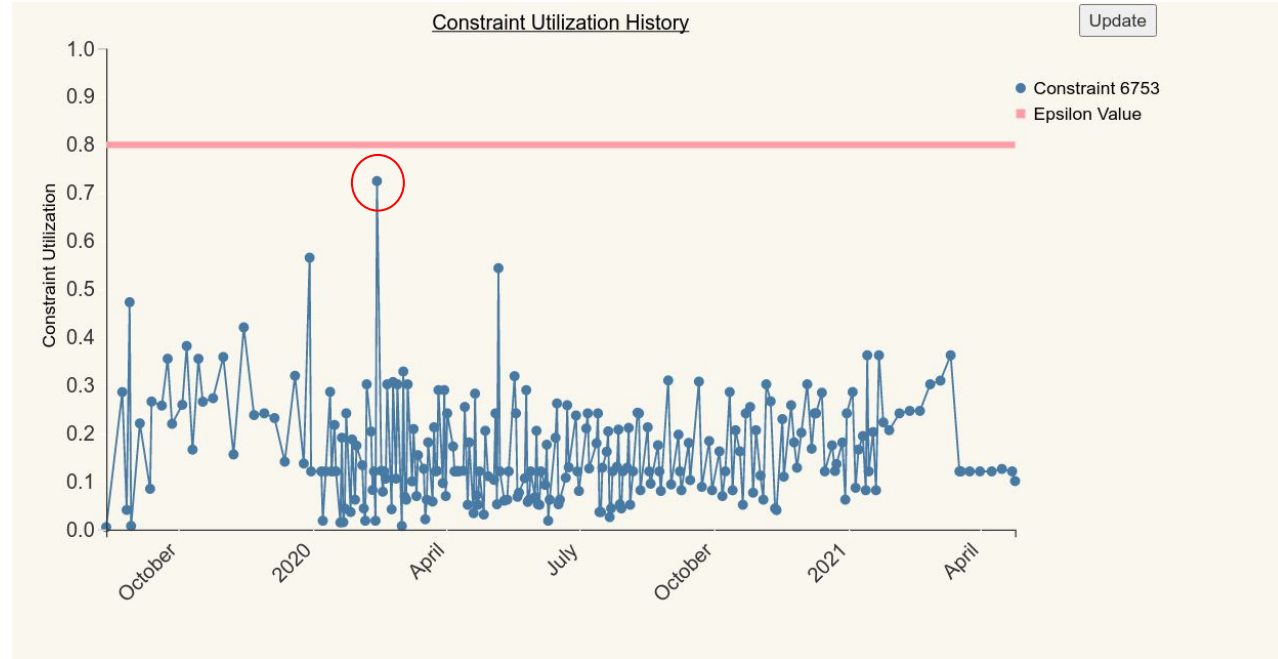
- Reporting that Product Structure X contains an underutilized constraint Y is not enough
- We are interested in *specific* Underutilized Constraints; **those whose removal from the graph will split up the graph into *roughly* equal sizes**

#	Product Structure ID	Component ID
0	12197	1
1	12197	2
2	315925	2
3	396955	0
4	306080	0



# When is a constraint underutilized?

- We use the *maximum utilization* to define this categorization



# Problems with Visualizing Large Product Structures

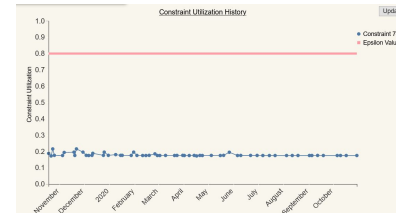
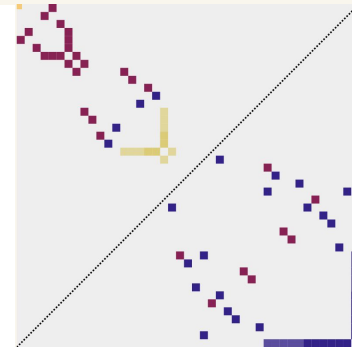
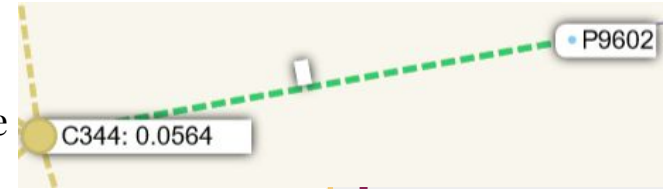


# Live-Demo



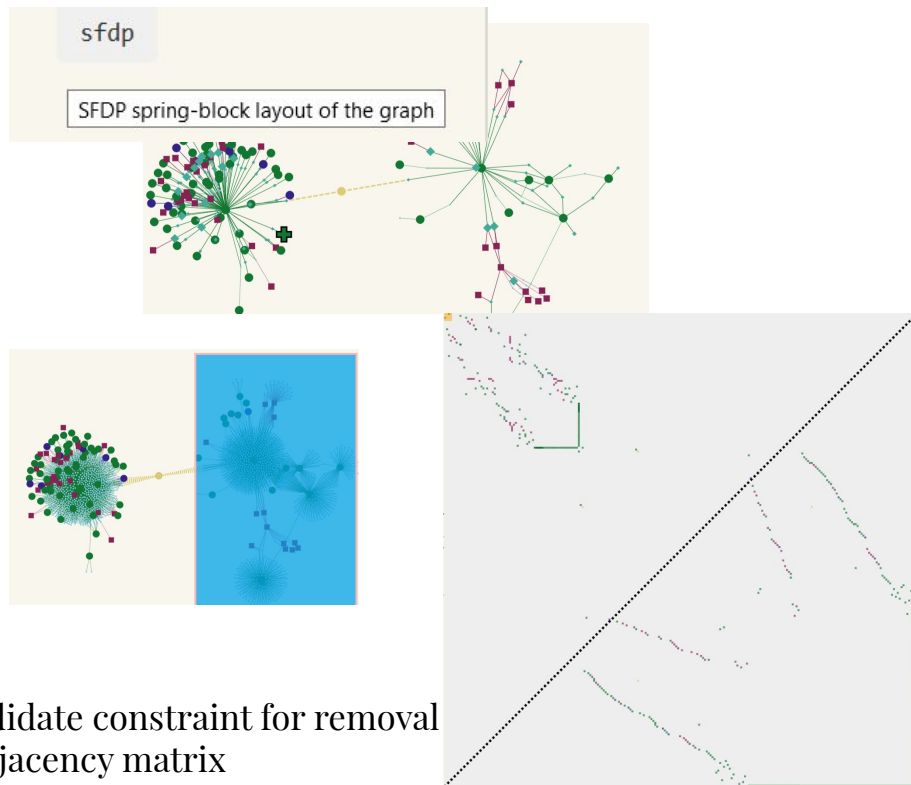
# Limitations

- Labeling Nodes & Edges
  - Hovering over (nodes & edges) displays their ID and value
  - But once selected, label disappears
- Matrix View- Node Counter
  - Dotted diagonal line is useful to estimate # nodes (Left vs. Right)
  - As the diagram grows in size, a node counter (Left vs. Right) would be useful
- Constraint Utilization History - ReSize
  - The window can't be resized, issue on laptops
- Different explorer support
  - Not supported:



# Future Work

- Rerun sfdp after contraction
  - On Large datasets
  - Placement should be preserved
  - Hairballing reduced
- Color overlay to split families
  - Assist in visually distinguishing the cut
    - Together with the center node
    - And dashed edges
- Matrix - enhancement
  - Ordering Exploration (Larger graphs)
  - Thicker Rows and Columns for the candidate constraint for removal
  - Epsilon variation not reflected in the adjacency matrix



# Questions

