Graph Stories
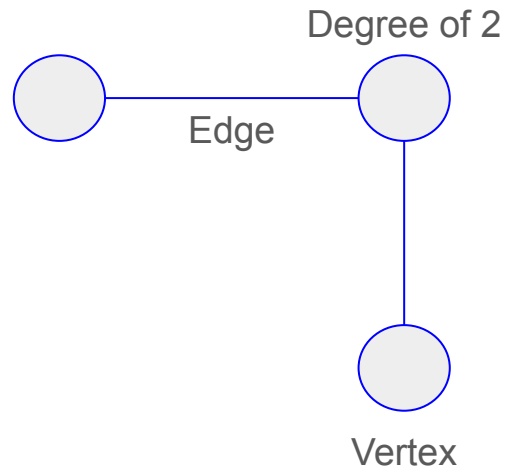
Kevin Carman
Advisor: Dr. James Abello
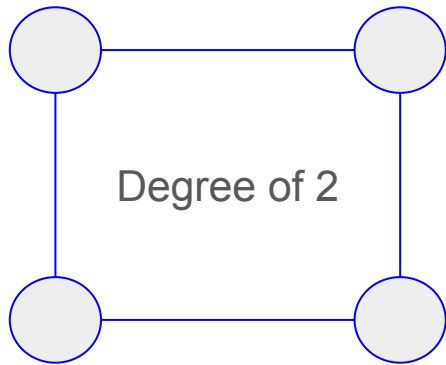
Introduction

- Sensemaking of massive graphs
- Finding peculiarities in data
- Examples

Degree of 2

Edge

Vertex

The Peeling Algorithm

- Decompose graphs into layers
  - Degree of vertices
  - Partition of edges
- Fixed points
  - An element that maps to itself by a function

Degree of 2
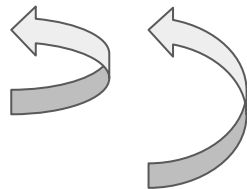
The Peeling Algorithm

Phase 1: Core Vertex Partition

- Iteratively remove the vertices with the lowest degree
- Assign the removed vertices a peel value
- Repeat until the degree of every vertex is > the core number
- Repeat until all of the vertices are removed
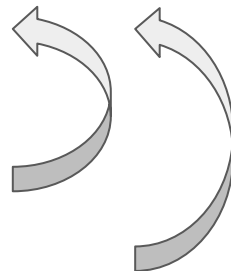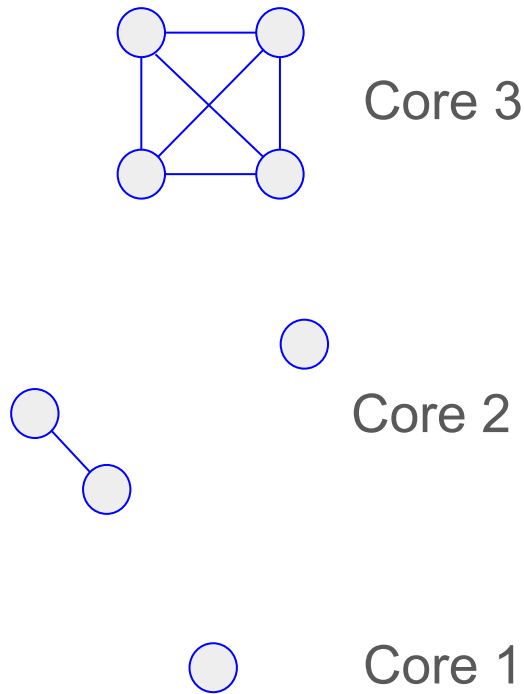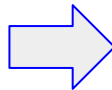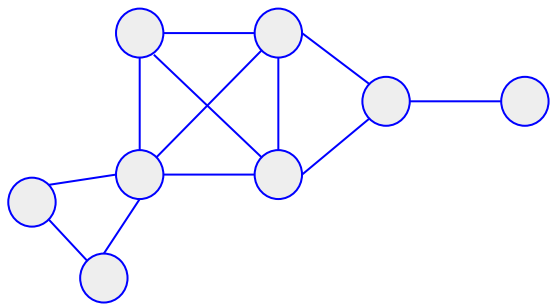
The Peeling Algorithm

Phase 2: Edge Partition

- Delete the subgraph of the vertices with the highest peel value
- Iteratively remove the vertices with the lowest degree
- Repeat until the degree of every vertex is > the core number
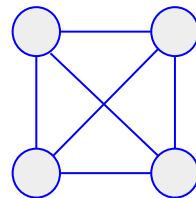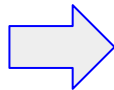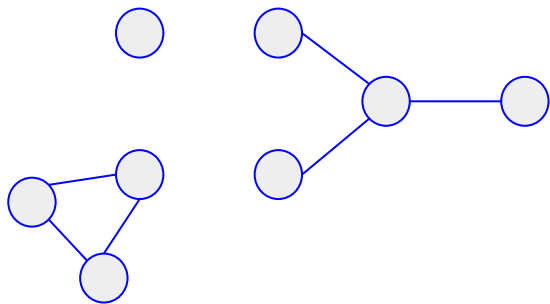- Repeat until all of the vertices are removed
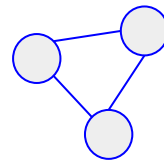
The Peeling Algorithm
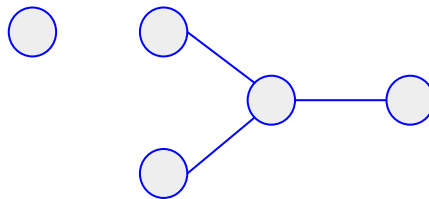
Phase 1

Core 3

Core 2

Core 1

The Peeling Algorithm

Phase 2

Core 3

Core 2

Core 1

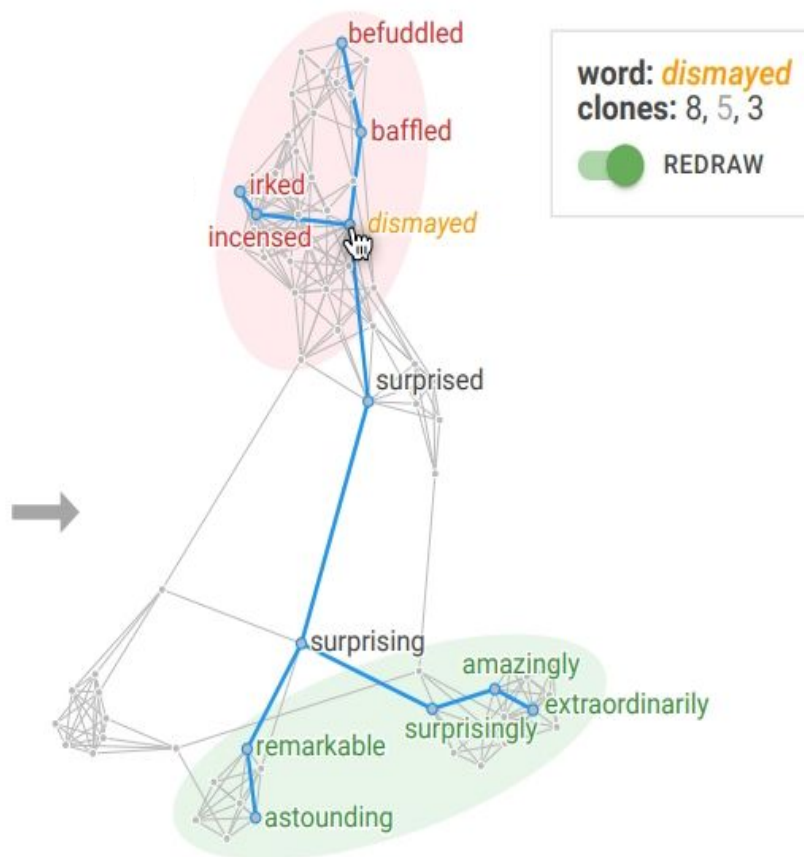# ATLAS

A 3D Decomposition Overview

Higher, denser layers

Graph layer 8

B Graph Ribbon

15
14
13
12
11
10
9
8   16
7   28
6   30
5   59
4   98
3   300
2   1277
1   19125

C Layers and Clone View

befuddled
baffled
irked
dismayed
incensed
surprised
surprising
amazingly
extraordinarily
surprisingly
remarkable
astounding
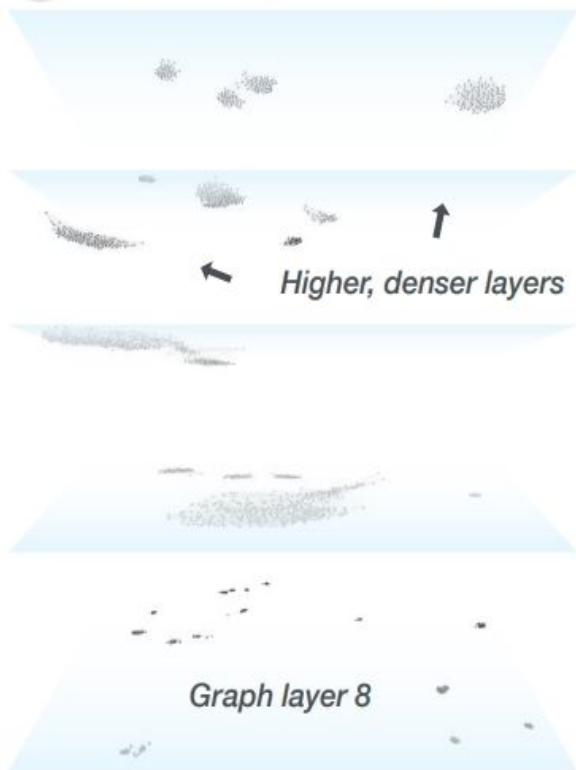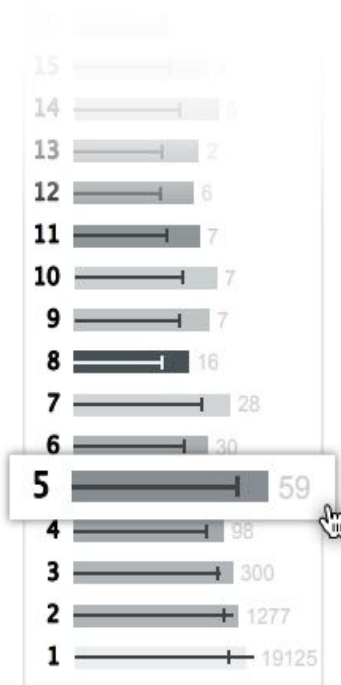
word: *dismayed*
clones: 8, 5, 3
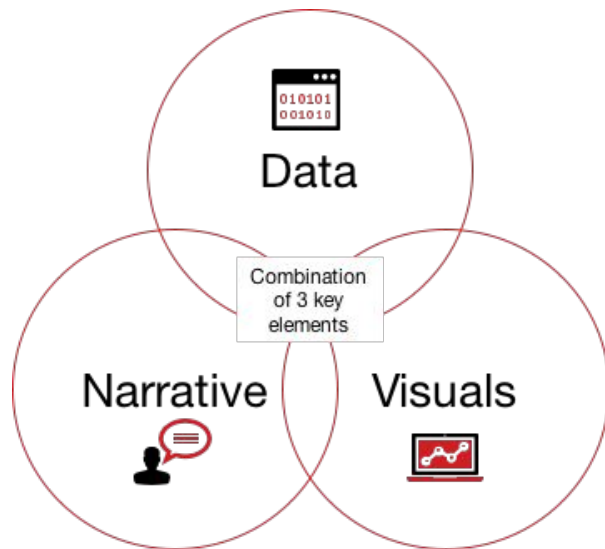REDRAW

Goals

- Analyze the metadata of fixed points
- Algorithmically build a "story" that summarizes the data
- Find a way to present the stories to the user

Acknowledgements

References

- [Atlas: Local Graph Exploration in a Global Context](#)