

# Spatial Social Community

Lu CHen

Swinburne University of Technology

*luchen@swin.edu.au*

June 20, 2016

## 1 Preliminary

- Trusses
- Triangle connected k-truss
- K-truss community
- Finding k-truss communities

## 2 Second Section

## Definition

A  $k$ -truss is a none-trivial, one-component subgraph such that each edge is reinforced by at least  $k-2$  pairs of edges making a triangle with the edge. (Non-trivial here excludes an isolated vertex as a truss)

# Triangle connected k-truss

- $k \geq 3$
- Triangle adjacency: given two triangles, they are adjacent if and they share a common edge
- Triangle connectivity: given any two triangles  $\triangle_s$  and  $\triangle_t$  in  $G$ , they are connected if there exist a series of triangles  $\triangle_1, \dots, \triangle_n$  in  $G$ , where  $n \geq 2$ , such that,  $\triangle_1 = \triangle_s$ ,  $\triangle_n = \triangle_t$  and for  $1 \leq i < n$ ,  $\triangle_i$  and  $\triangle_{i+1}$  are adjacent

## Definition

K-truss community: 1)k-truss, 2)triangle connected, and 3)maximal subgraph

## Basic

- Edge trussness index: running k-truss decomposition
- Query k-truss communities from a vertex  $v$ : running BFS search from edges containing  $v$

## Better

- TCP index: it is built on top of edge trussness index
- Query k-truss communities from a vertex  $v$ : running BFS search from  $v$

# Finding k-truss communities

- Observation: Given a  $k$ , a edge  $e$  in  $G = (V, E)$  can only be contained by at most one  $k$ -truss community
- Finding  $k$ -truss communities: For each unvisited edge  $e$  with trussness no less than  $k$  in  $G = (V, E)$ , we run BFS from it.

# Table

Treatments	Response 1	Response 2
Treatment 1	0.0003262	0.562
Treatment 2	0.0015681	0.910
Treatment 3	0.0009271	0.296

Table: Table caption

# Theorem

Theorem (Mass–energy equivalence)

$$E = mc^2$$



## Example (Theorem Slide Code)

```
\begin{frame}  
\frametitle{Theorem}  
\begin{theorem}[Mass--energy equivalence]  
$E = mc^2$  
\end{theorem}  
\end{frame}
```

# Figure

Uncomment the code on this slide to include your own image from the same directory as the template .TeX file.

An example of the `\cite` command to cite within the presentation:

This statement requires citation [Smith, 2012].



John Smith (2012)

Title of the publication

*Journal Name* 12(3), 45 – 678.

# The End