Cheng Siong Lee, Clayton School of IT Monash Universitv. Australia

Emerging research interest:

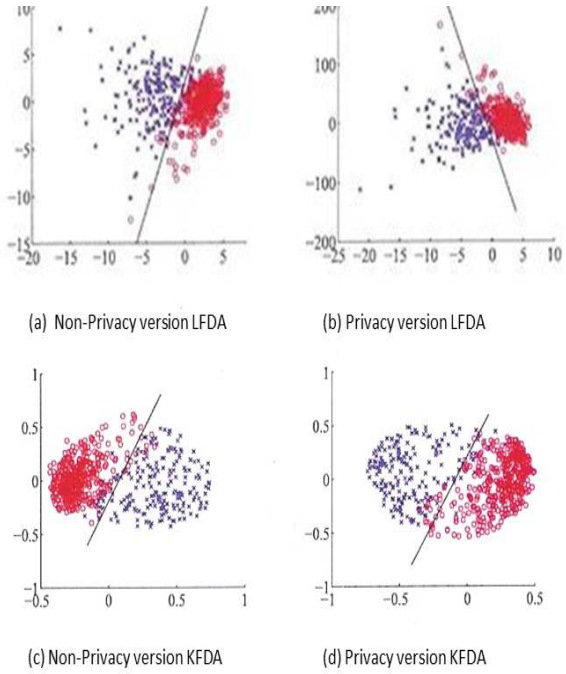
1. Business intelligence and real-time enterprise systems
2. Innovation systems

Current research interest:

1. Adaptive Optimal Signal Processing
2. Data, Text and Web
3. Computational Finance and Corporate Financial Management

PPDM using secured (SMM) and fast secured (FSMM) matrix multiplications: Data Driven Security & Privacy Issues

Some PPDM memory improvement Linear (LFDA)and Kernel Fisher discriminant analysis (KFDA) research outcome:



(a) Non-Privacy version LFDA (b) Privacy version LFDA

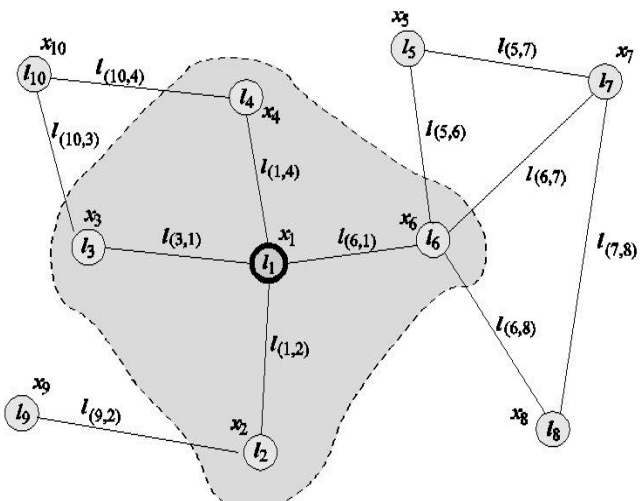
(c) Non-Privacy version KFDA (d) Privacy version KFDA

Figure 1: Experimental results with real datasets

Concept Discovery

- **Text Processing**
  - For every document, extract all nouns (i.e. t using Hidden Markov Model (HMM)
- **Encoding**
  - For all nouns extracted, compute a term-ter association matrix from a term-document m
- **Concept Discovery**
  - Cluster related nouns to form concepts by f the term-term association matrix to the Self Organizing Map (SOM) as inputs

Graph Neural Network (GNN)



$$x_1 = f_w(l_1, l_{(1,2)}, l_{(3,1)}, l_{(1,4)}, l_{(6,1)}, x_2, x_3, x_4, x_6, l_2, l_3, l_4, l_6)$$

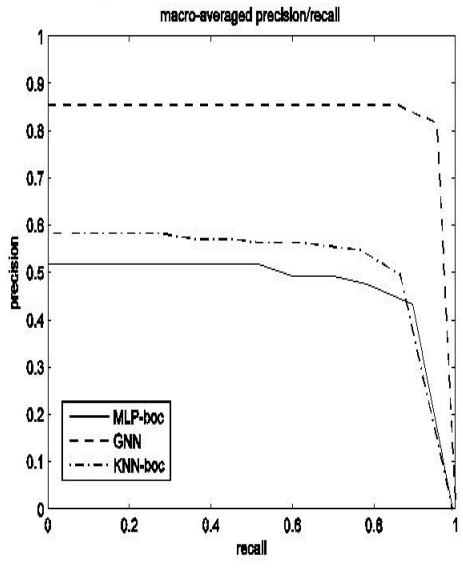
$l_{co[1]}$ $x_{ne[1]}$ $l_{ne[n]}$

Concept-Link Graph Generation

1. For every document, we map every existing noun to a concept
2. For every paragraph in a document, we count the occurrence of every existing concept
3. Represent each document as a concept-paragraph matrix *A*
4. Apply Singular Value Decomposition to the concept-paragraph matrix $A = U\Sigma V^T$
5. Compute the Concept-Link graph as a concept to-concept associative matrix $AA^T = U\Sigma^2 U^T$

Experimental Results

- Macro averaged precision/recall



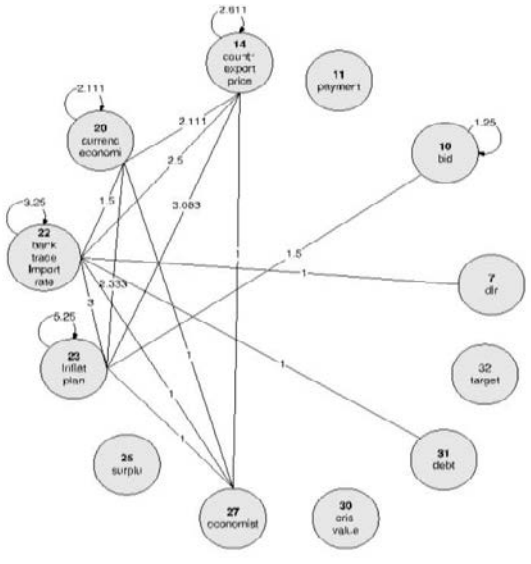
Text mining using graph neural network

Using Concept-link Graph for semi-structured documents ranking/classification

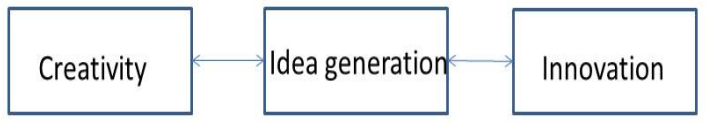
Approach- 2 Major Steps:

- Step 1: Concept Discovery
  - Text Processing
  - Encoding
  - Concept Discovery
- Step 2: Concept-Link Graph Generation

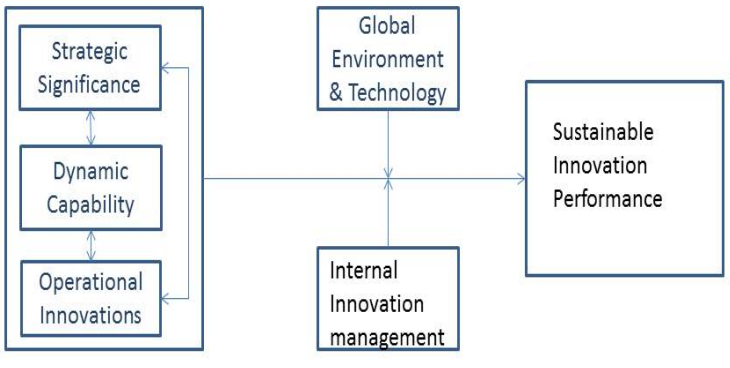
ConceptLink Graph Example



Radical/Open innovation: Data Driven



Innovation Value Chain – Innovative Business Model



EBISS2012 – 16-21 July, Brussel; http://www.infotech.monash.edu.au