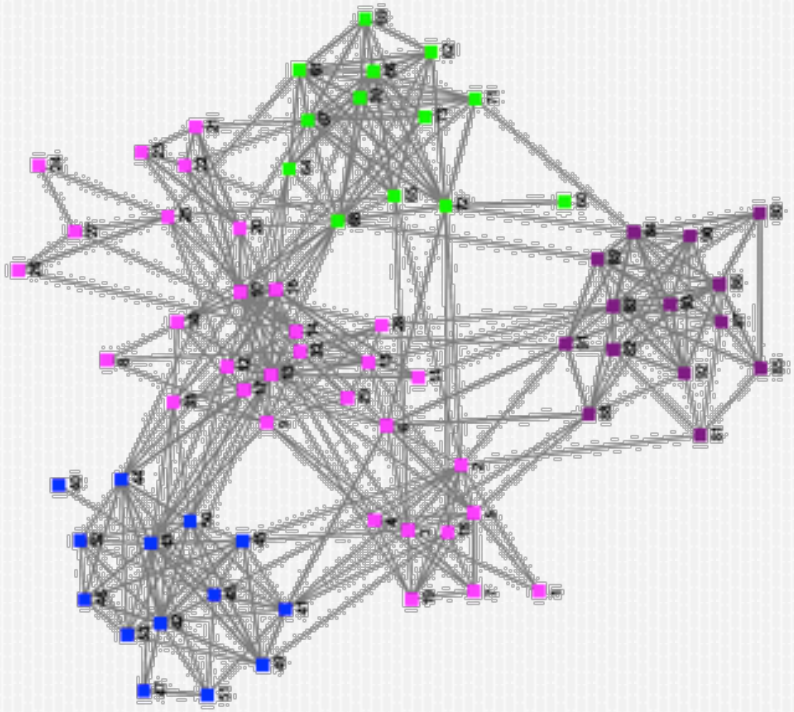
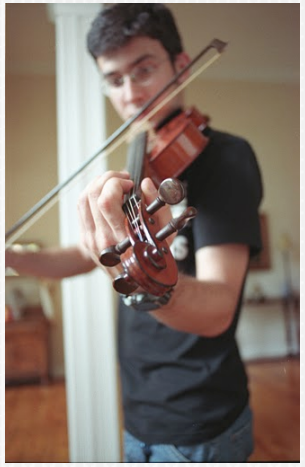


ICS – SOCIAL NETWORK DISCOVERY

Presented by - Karan Kurani and Jason Marcell

(Some slides adapted from presentation on 12th November)

PEOPLE



Jason

Karan

Kiyan

Bistra

Theo

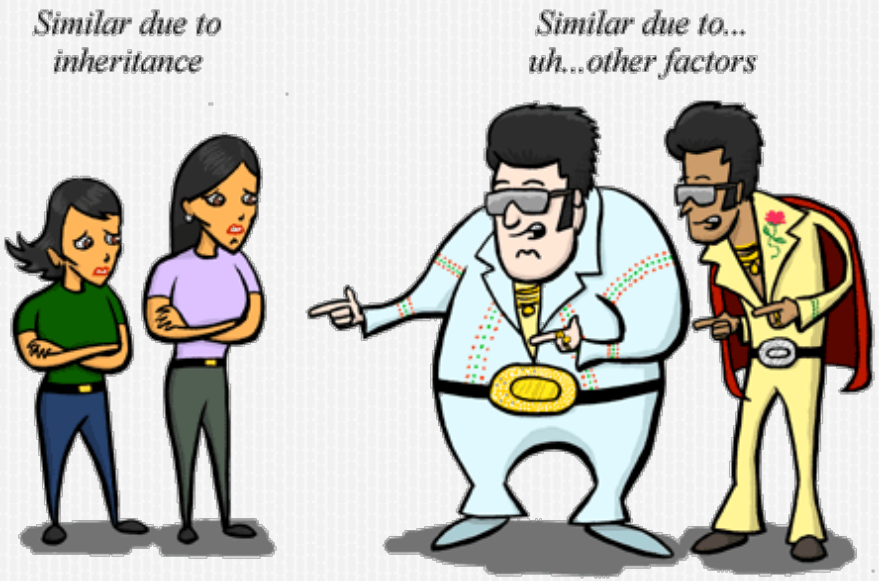
OVERVIEW

- Goal
- Datasets
- Software Engineering
- Latent Dirichlet Allocation
- Methodology
- Results
- Future Work

GOAL

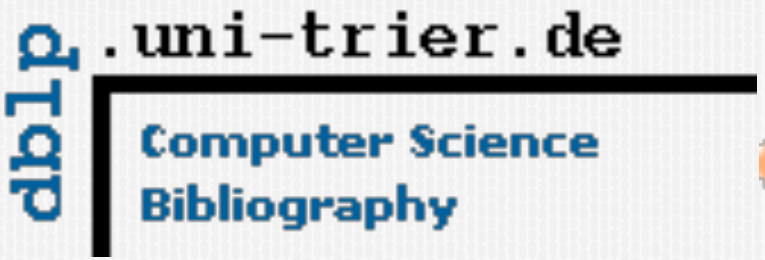
- Find people who are doing Comp Sust. But who are not aware about it or we don't know about them.

- Techniques –
  - Citation Network Analysis (Not implemented yet)
  - Similarity Measure
  - Combination of both.



DATASETS

- CS Based - DBLP, arnetminer.org, CiteSeerX.
- Multidisciplinary – BASE, Bioone, ChemSeerX, Crossref for citation.
- Currently Used –



SOFTWARE ENGINEERING PRACTICES

Revision Control

Logging

Unit Testing

Object-Relational Mapping

Integrated Development Environment

APPROACHES

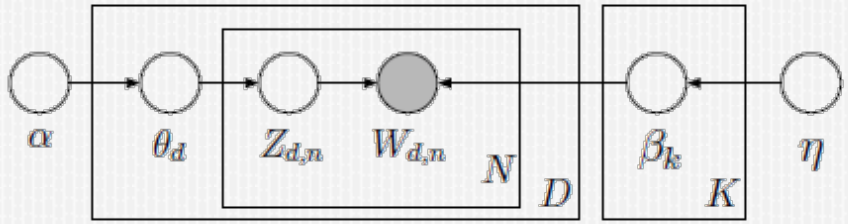
- DBLP Stats:
  - Total docs: 1632441
  - With abstract text: 653507
  - With references: 316559

- Possible approaches included –
  - LSA, pLSA and LDA.
  - All of them make a bag of words model.

LATENT DIRICHLET ALLOCATION

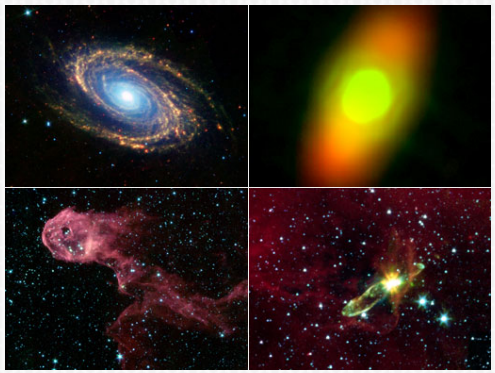
computer	chemistry	cortex	orbit	infection
methods	synthesis	stimulus	dust	immune
number	oxidation	fig	jupiter	aids
two	reaction	vision	line	infected
principle	product	neuron	system	viral
design	organic	recordings	solar	cells
access	conditions	visual	gas	vaccine
processing	cluster	stimuli	atmospheric	antibodies
advantage	molecule	recorded	mars	hiv
important	studies	motor	field	parasite

FIGURE 1. Five topics from a 50-topic LDA model fit to *Science* from 1980–2002.



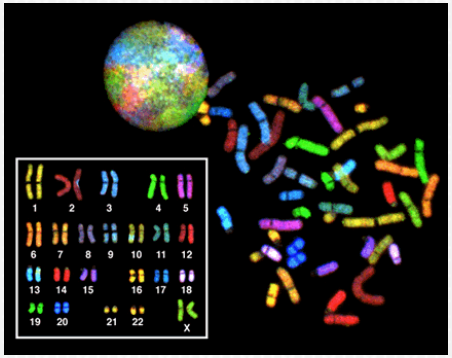
- *From the review paper “Topic Models” - David M. Blei, Princeton University. John D. Lafferty, Carnegie Mellon University

APPLICATIONS OF LDA



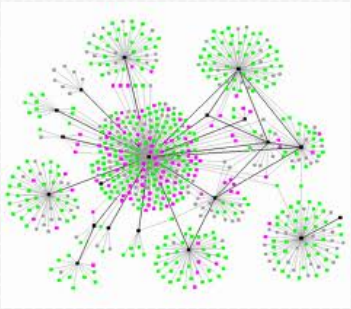
Images (Fei-Fei and Perona, 2005; Russell et al., 2006; Blei and Jordan, 2003; Barnard et al., 2003),

Population genetics data (Pritchard et al., 2000),

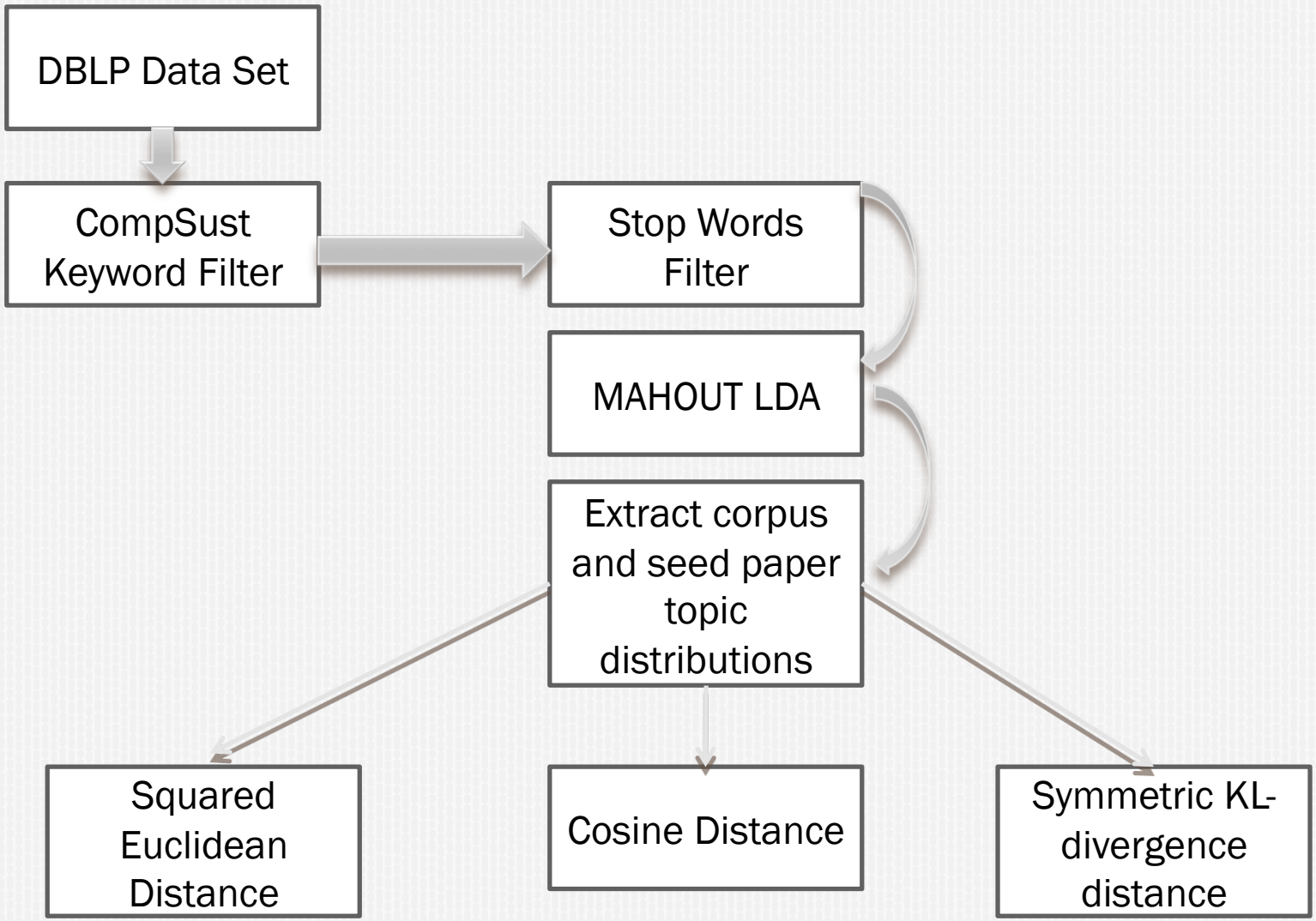


Survey data (Erosheva et al., 2007),

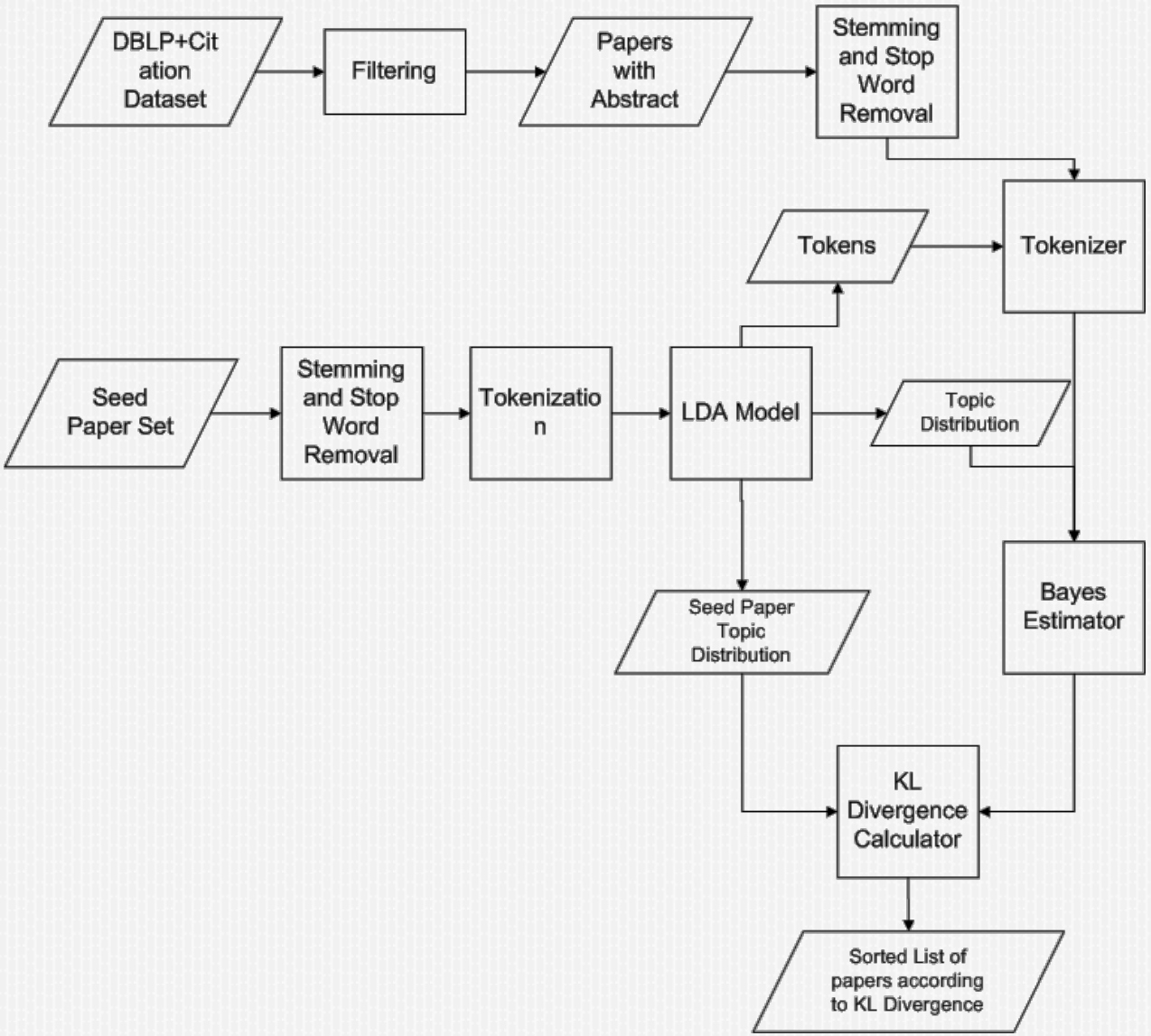
Social networks data (Airoldi et al.,2007).



LDA WITH MAHOUT



LDA USING LINGPIPE



RESULTS ON THE WEB

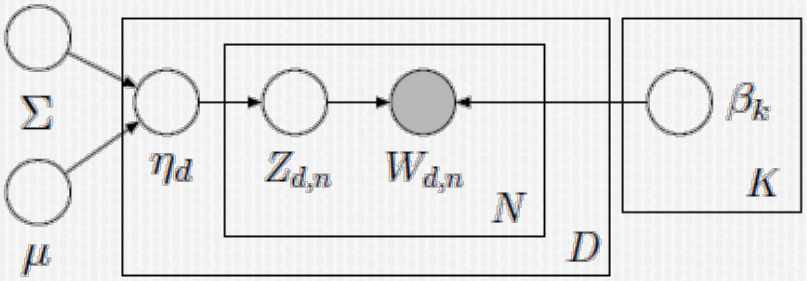
- Evolving results set can be browsed on the web:
  http://www.cs.cornell.edu/~kiyan/compsust-sn/

RESULTS AFTER A MONTH

- Noisy but Encouraging (Most of the results are recent (2006-2010.))

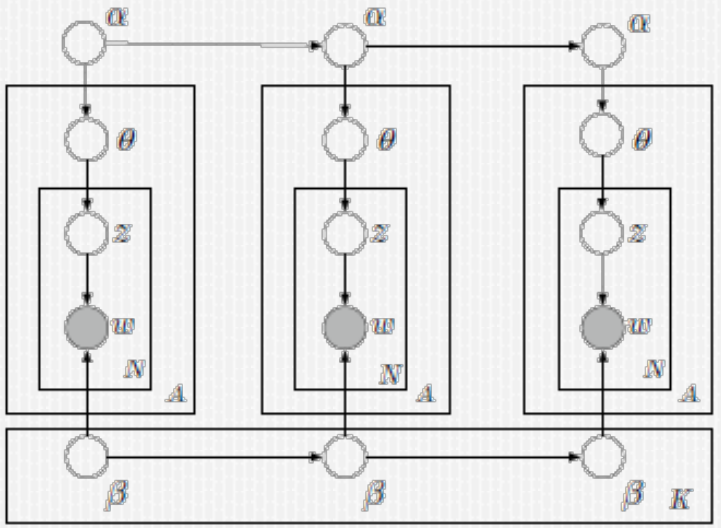
- Reasons -
- Many false positives because of alternate uses of keywords.
- Over fitting because of sub optimal parameters for LDA.

BUILDING ON LDA – SOME MORE MODELS



Correlated Topic Models

Dynamic Topic Models



NEXT STEPS

- Add additional data sources.
- Customized web crawler.
- Incorporate network analysis (Author – topic model, Link-LDA)

THANKS!