Thesis Plan as it should be

Title : Random Graph model for links prediction: Social network perspective

Introduction

Mathematical Background

- Probability (and random process)
  - Random variable, random vector, array and process and object in general.
  - Convergence of random variable
  - Bayesian inference
- Exponential familly distributions
- Fondemental Theorem
  - representation theorems
- Nonparametric prior (DP, HDP, GP)

State of the Art

- Social network analysis
  - type of networks and applications (clustering, link prediction, compression)
  - Properties
  - Algorithms
- Random graph model
  - Erdos-Reni
  - Barabasi-ALbert
  - Stochatic Blockmodel
    * SB
    * IRM
  - Stochastic Mixed-Membership model
    * (latent space ?)
    * LFM
    * MMSB
    * non parametric extensions
- Bayesian Inference
  - Markov Chain Monte Carlo (MCMC)
  - Variational Inference

      – Stochastic Variationan Inference (SVB)
- Other Approach
  - matrix factorization

Study of random graph model properties for social network (contrib 1)

- homophily

- preferential attachment

- sparsity

- experimentation

- (note on pymake (contrib 3): * plateform for reproducible research (open source project)

Model for weighted and temporal networks (contrib 2)

- poisson process (and/or neg bin,) model extension of MMSB (retains as best properties and scalable trough SVB)
- temporal/weighted large scale networks inference

if possible:

- review theoritical properties defined contrib 1
- process with growing edge and node.

Perspective

Conclusion