Semester Summary

Shi Zhi
Research - A Dynamic Model for Evolving Truth Discovery

- Previous: static data
- Real scenarios: sequential, dynamic information
- E.g. weather condition, stock, flight status
- Developed a Hidden Markov model to model the dynamics of truths and source quality
- Submit to WWW
EvolvT: Hidden Markov Model

Dynamics of truth:
\[ \mu_{t+1} = A \mu_t + \omega_t \]

A: transition matrix, omega: error term
\[ \omega_t \sim \text{Normal}(0, \Gamma_t) \]

Observation ~ latent truths
\[ v_t = C \mu_t + \epsilon_t, \ C = I_O \otimes 1_s. \]

Epsilon: error term: variance of source
\[ \epsilon_t \sim \text{Normal}(0, \Pi_t) \]

\[ C = \begin{pmatrix}
1_s & * & \cdots & * \\
* & 1_s & \cdots & * \\
\vdots & \vdots & \ddots & \vdots \\
* & \cdots & * & 1_s
\end{pmatrix}, \Pi = \begin{pmatrix}
\Sigma & * & \cdots & * \\
* & \Sigma & \cdots & * \\
\vdots & \vdots & \ddots & \vdots \\
* & \cdots & * & \Sigma
\end{pmatrix} \]

Diagonal: Source quality
Off-diagonal: source dependency
\[ \Sigma = \begin{pmatrix}
\sigma_1^2 & \sigma_{1,2} & \sigma_{1,3} & \cdots & \sigma_{1,S} \\
\sigma_{2,1} & \sigma_2^2 & \sigma_{2,3} & \cdots & \sigma_{2,S} \\
\vdots & \vdots & \ddots & \ddots & \vdots \\
\sigma_{S,1} & \cdots & \cdots & \sigma_{S,S-1} & \sigma_S^2
\end{pmatrix} \]
Research – Claim verification

• Two-step model to find the relevant stances and justify the opinion of the stances.
• Use attention model to identify the key correlations between the query claim and the stances.
• Target at KDD
Research – Zero-shot entity extraction & typing

• Combining pattern mining and relation classification
  – Classification can help to identify the correct (entity, type) pair can good patterns.
  – Patterns can be generalized to find new entities and pairs.

• Colla. with Qi, Dongming

• Target at KDD
Others

• Publications
  – CIKM’17: Unsupervised entity recognition (Aravind, Adit)
  – CIKM’17(demo): Real-time claim verification system (Yicheng, Jiayi, Chao)
  – EMNLP’17: Representation Learning on relation extraction (Lucas, Xiang, Qi)

• Attend CIKM conference

• TA for CS412

• Job hunting