Individual Research Project (ESR-2)

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Contents

• Self-Introduction
• Research Framework
• Current Progress and future work
Research Background

Master

Associate Researcher

Research Consulate

PHD in Padova MC ITN project

| 2014.9-2017.2 | 2017.6-2017.7 | 2017.7-2018.6 | 2018.6-..... | .... |
Research

- Publish 15 peer-review papers, including
  - Conferences:
    ✓ 1 ACM SIGIR long paper
    ✓ 2 CIKM long papers, short paper
    ✓ 1 AAAI long paper
    ✓ 2 IJCAI oral papers
  - Journals:
    ✓ 3 Entropy [JCR Q2]
    ✓ 1 Information Science [JCR Q1]
    ✓ 1 Theoretical Computer Science [JCR Q1]

- Google Scholar Citation: 91

- New Chinese Boob (deep learning and recommendation system) will be published recently.

- SIGIR Best Paper Award Honourable Mentions

[Scimago Journal & Country Rank](https://www.scimagojr.com/journalrank.php)
Research Proposal- ESR2

**Dynamic** content monitoring and exploration using vector spaces

![Diagram showing dynamic content monitoring and exploration using vector spaces](attachment:image.png)
Research Plan

- **Vector Space Representation** for static text/document
  - Quantum-inspired representation for static text \[1,2,3,7,8,9\]
  - Some benchmarks and open-source project \[6\]
  - Overview of Vector Space approaches

July 2018 – July 2019

- Extend it to **dynamic** content
  - Exploring the dynamics of information e.g. recommendation \[4\] and language model
  - Implement it in dynamic corpora, e.g. newspaper, blogs, paper collections

July 2019 ...

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Progress 1: End-2-end Language model

Progress 2: Complex Word Embedding

Interference term for semantic composition

\[
z^* = z_1 + z_2 = r_1 e^{i\theta_1} + r_2 e^{i\theta_2} = \sqrt{r_1^2 + r_2^2 + 2r_1r_2 \cos(\theta_2 - \theta_1)} \times e^{i \arctan\left(\frac{r_1 \sin(\theta_1) + r_2 \sin(\theta_2)}{r_1 \cos(\theta_1) + r_2 \cos(\theta_2)}\right)}
\]

Li Qiuchi, Uprety Sagar, **Wang Benyou**, Song Dawei Quantum-inspired Complex Word Embedding, ACL 2018 3rd Workshop on Representation Learning for NLP, *ACL 2018 RepL4NLP*
Progress 3: Quantum Many-body function for text

Use CNN to approximate Tensor Decomposition in the projection of Quantum Many-Body Language Function

Progress 5: Dynamics in Recommendation System

Wei Zhao, Wang Benyou, Jianbo Ye, Yongqiang Gao, Min Yang, Xiaojun Chen, PLASTIC: Prioritize Long and Short-term Information in Top-n Recommendation using Adversarial Training, IJCAI 2018
Future Work

- Deep Investigation of Quantum-inspired textual representation
- Quantum-inspired evolved language model for dynamic
- Thematic issues in dynamic corpora
Publications


Li Quichi, Upreti Sagar, Wang Benyou, Song Dawei Quantum-inspired Complex Word Embedding, ACL 2018 3rd Workshop on Representation Learning for NLP, ACL 2018 RepL4NLP


Wei Zhao, Wang Benyou, Jianbo Ye, Yongqiang Gao, Xiaojun Chen, PLASTIC: Prioritize Long and Short-term Information in Top-n Recommendation using Adversarial Training, IJCAI 2018

Wei Zhao, Wang Benyou, Jianbo Ye, Min Yang, Zhou Zhao, Rouitian Luo, Yu Qiao A Multi-task Learning Approach for Image Captioning, IJCAI 2018


Huang Xin, Wei zhaow, Wang Benyou, Rui Zhao. Recommendation System and Deep Learning, Tsinghua University Press. chapters related "Learn to rank" and "Generative Adversarial Nets(GAN) for Recommendation"