



H2020-MSCA-ITN Grant Agreement N. 721321



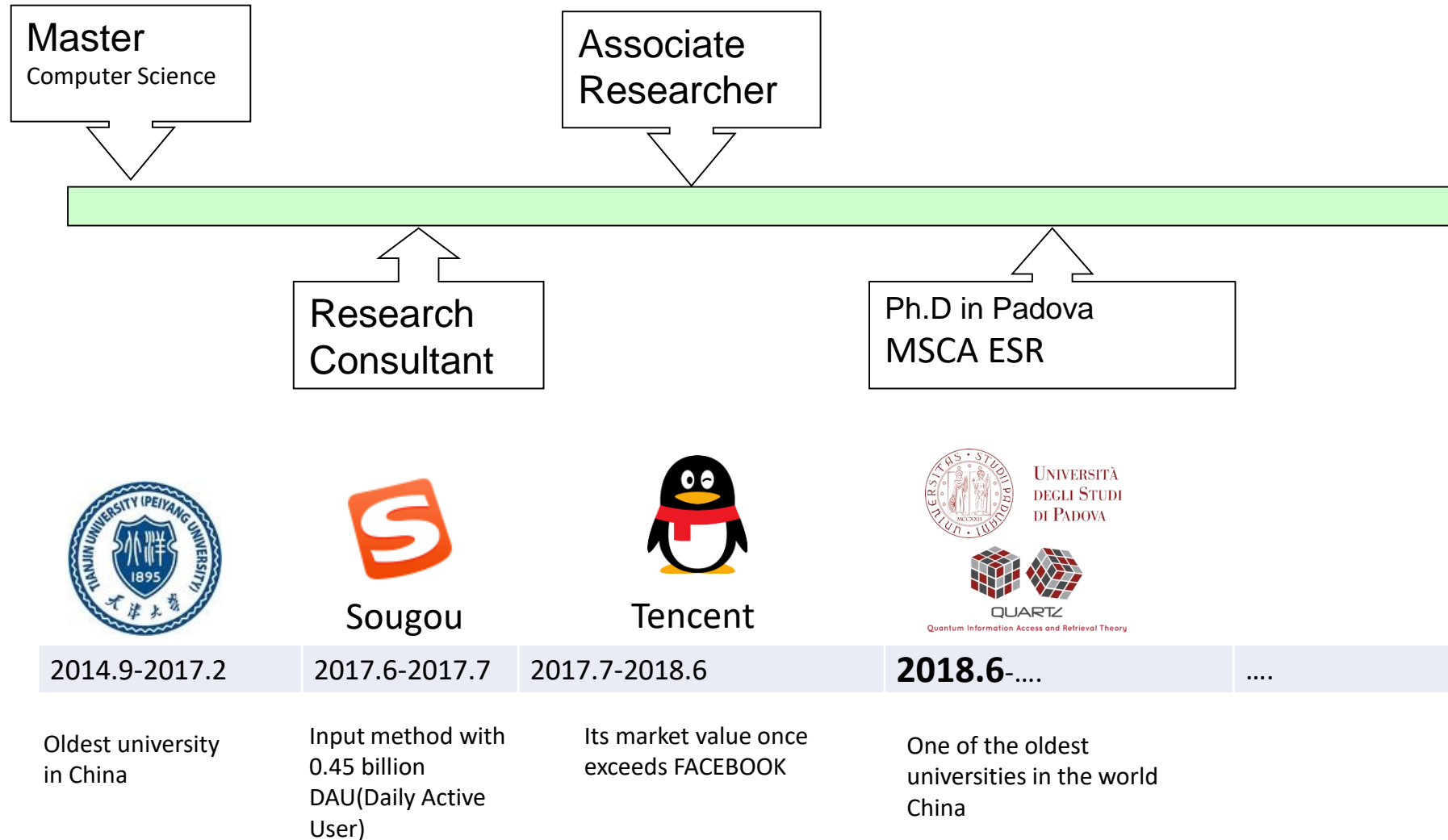
# Dynamic content monitoring and exploration using vector spaces (ESR-2)

**Benyou Wang**

University of Padova

University of Padova, 06/12/2018

# Background



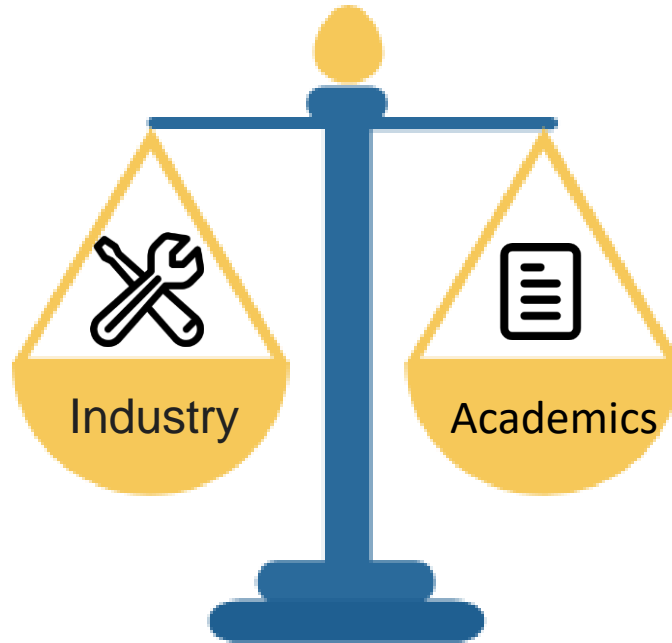
# Industry



- ✓ The main coder and designer for First-generation customer server in the Tencent cloud
- ✓ First DL practice for Q-zone video



- ✓ Deep learning- based language model

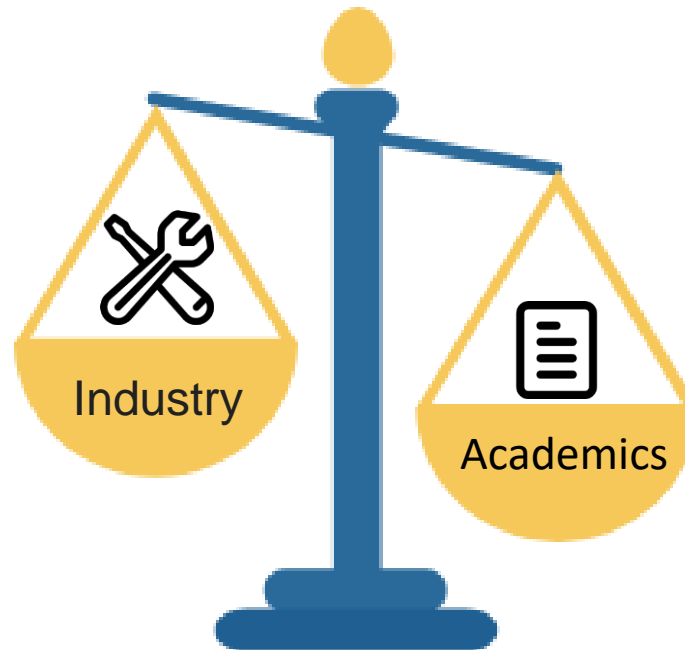


Tencent's market value once exceeded FACEBOOK, ranked fifth in the world, only less than Apple, Google, Microsoft, and Amazon. The biggest IT company in the world



Sougou has the word-leading NLP technologies, with 0.45 billion DAU for input method and second biggest search engine in Chinese

# Academics



- Publish 15 papers

- **Conferences:**

- ✓ 1 **SIGIR** oral
- ✓ 2 **CIKM** oral & poster
- ✓ 1 **AAAI** oral
- ✓ 2 **IJCAI** oral

- **Journals:**

- ✓ 3 **Entropy** [JCR Q2] <sup>[1]</sup>
- ✓ 1 **Information Sciences** [JCR Q1]
- ✓ 1 **Theoretical Computer Science** [JCR Q1]



- Google Scholar Citation: 109 <sup>[2]</sup>



- New Chinese Boob “RecSys & DL”



- **SIGIR Best Paper Award Honorable Mentions**

[1] <https://scholar.google.com/citations?user=Jk4vJU8AAAAJ&hl=zh-CN>

[2] [Scimago Journal & Country Rank](https://www.scimagojr.com/journalrank.php) <https://www.scimagojr.com/journalrank.php>

# Training experiences

## Training organized by Quartz

- **Winter school** [1] in Padova, Italy
- **Autumn School** in Cuttbus, Germany
- English Training in Padova

## Conferences founded by Quartz

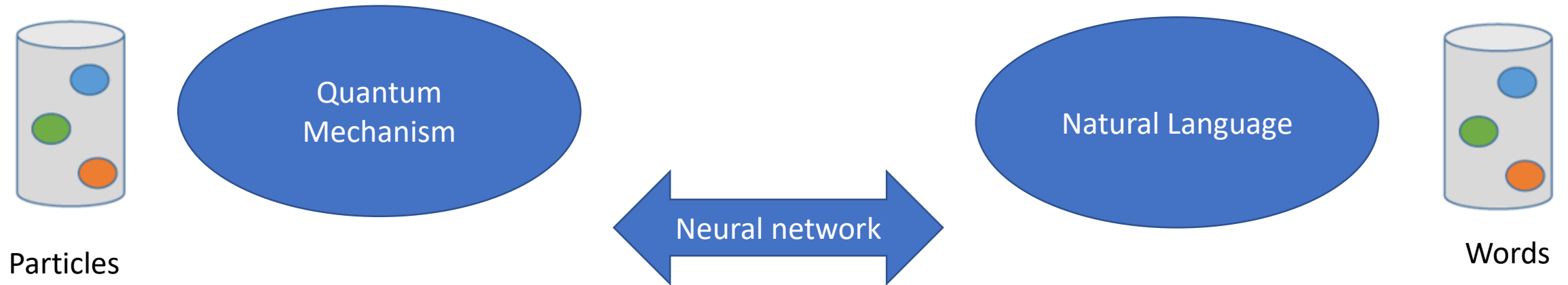
- **ICML 2018** in July, Sweden
- **IJCAI 2018** in July, Sweden, involving with two oral papers
- **ICTIR 2018** in Sep., China
- **CIKM 2018** in Oct., Italy, involving with one oral papers

## Upcoming Ph.D courses in the University of Padova

[1] I was recruited in that moment although not yet hired, I signed the contract since June, 2018



# Vision



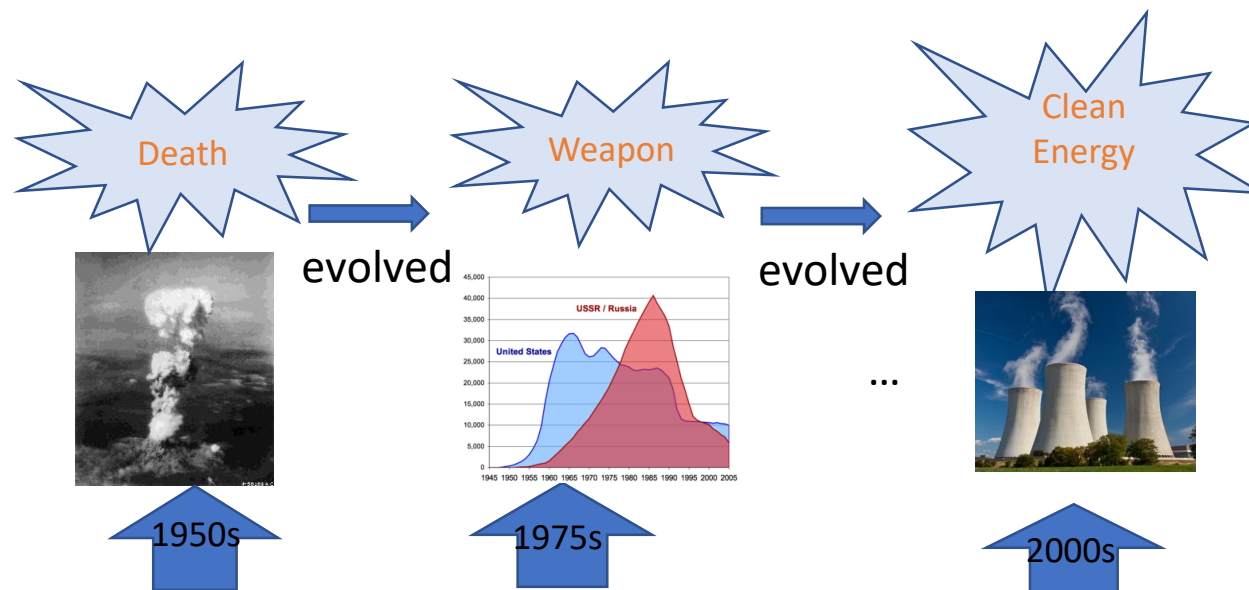
- Word embedding vector space
- Complex-valued Hilbert space
- Sequence/time-aware quantum representation

# Research Proposal- ESR2

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

**Nuclear Technology**


e.g. in newspaper, blogs



**Vector Space**, e.g. word embedding, Hilbert Space

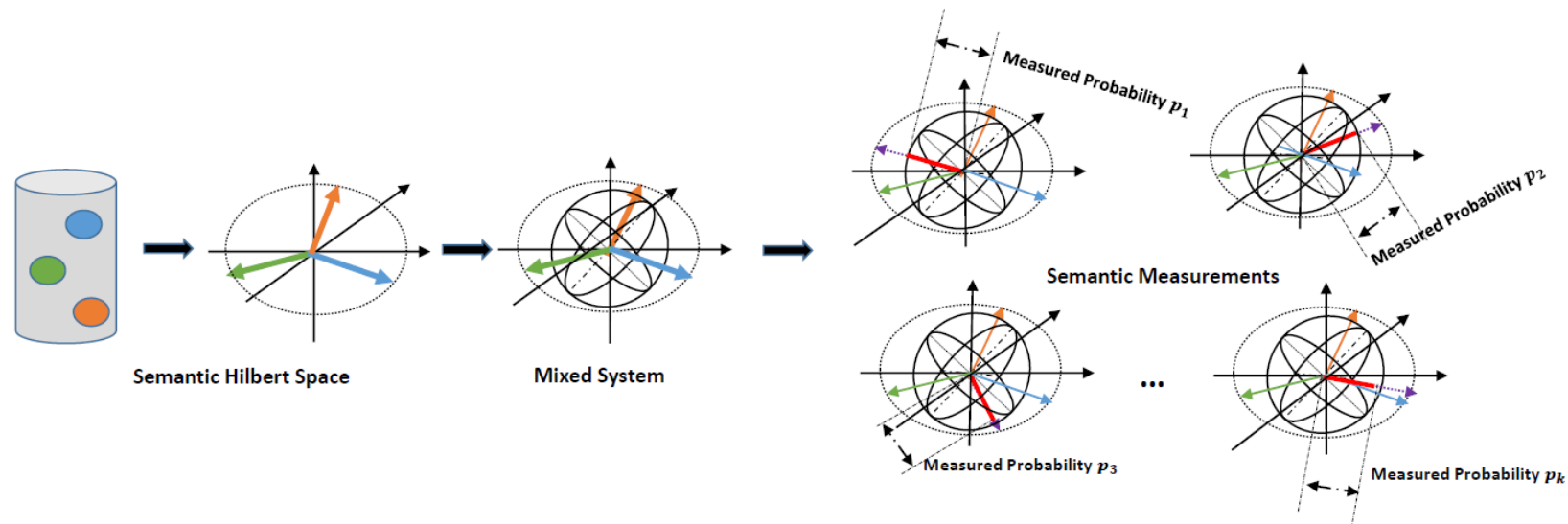
Examples Credited by Dr. Emanuele

# Research Plan

- 
- **Vector Space Representation** for **static** text/document
    - Quantum-inspired complex-valued framework for static text
    - Some benchmarks and open-source project
    - Overview of Vector Space approaches
  - Extend it to **dynamic** content
    - Extend the above static framework to language scenarios with dynamics, e.g. language model, multi-turn dialogue,
    - Address the thematic issues in dynamic corpora, e.g. newspaper, blogs, paper collections (Google books, ArXiv)



# Progress: Hilbert Semantic Vector Space (HSVS)



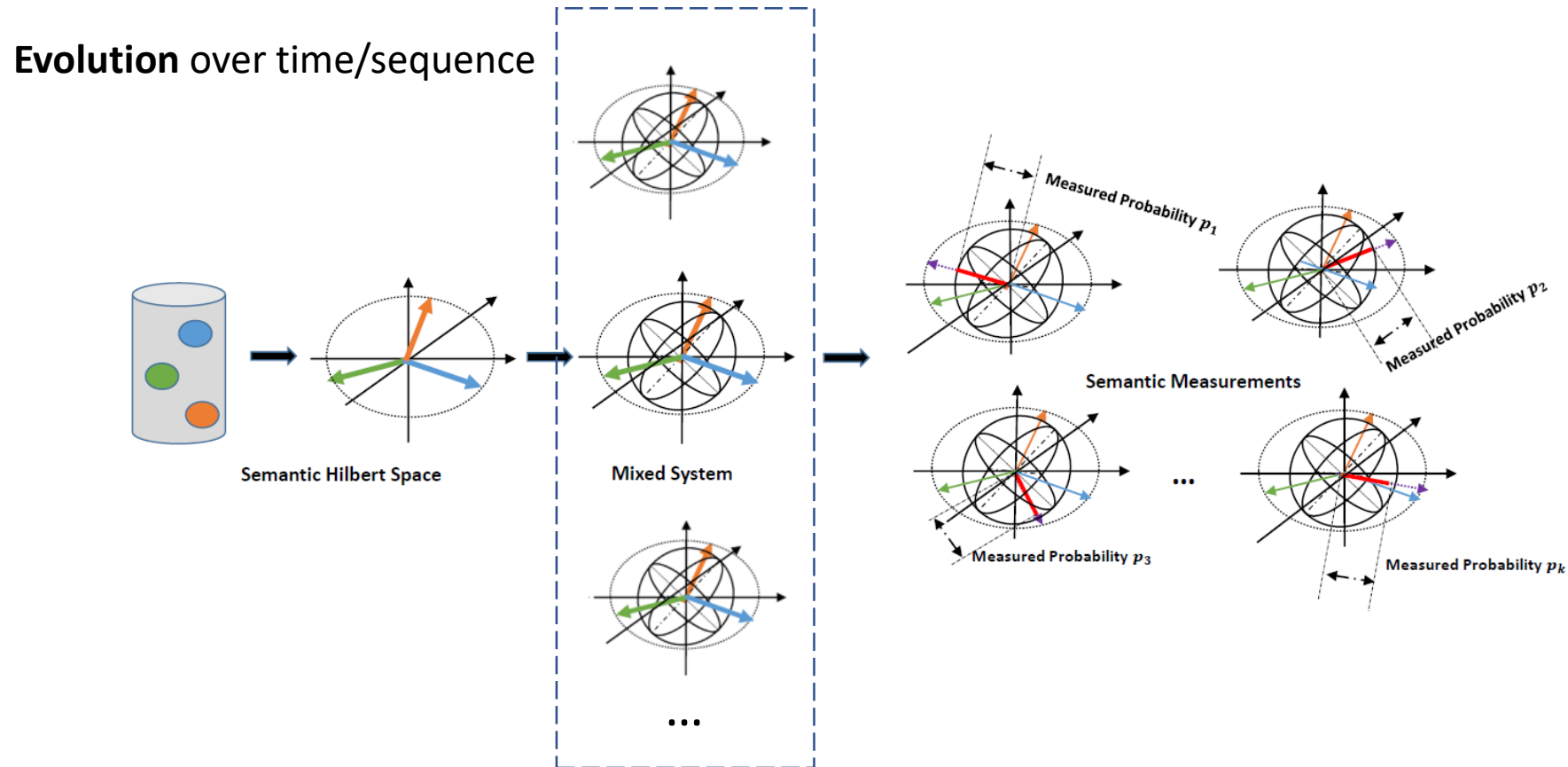
Benyou Wang, Li Q\*, Massimo M, Dawei S. Semantic Hilbert Space for Text Representation Learning, in progress.

Event, Location, DD/MM/YYYY

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# Future work : HSVS for dynamics



Benyou Wang, Li Q\*, Massimo M, Dawei S. Semantic Hilbert Space for Text Representation Learning, in progress.

# Publications

2018

- [1] Peng Zhang, Zhan Su, Lipeng Zhang, **Benyou Wang**, Dawei Song. 2018. A Quantum Many-body Wave Function Inspired Language Modeling Approach. **CIKM 2018**
- [2] 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**
- [3] Yazhou Zhang, Dawei Song, Peng Zhang, Panpan Wang, Jingfei Li, Xiang Li, **Benyou Wang** A Quantum-Inspired Multimodal Sentiment Analysis Framework. **Theoretical Computer Science** 2018.
- [4] 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**
- [5] Wei Zhao, **Wang Benyou**, Jianbo Ye, Min Yang, Zhou Zhao, Ruotian Luo, Yu Qiao A Multi-task Learning Approach for Image Captioning, **IJCAI 2018**
- [6] **Wang Benyou**, Wang Li. et al. TextZoo, a New Benchmark for Reconsidering Text Classification, in Arxiv. 2018.
- [7] Zhang Peng, Niu Jiabing, Su Zhan, **Wang Benyou** et al. End-to-End Quantum-like Language Models with Application to Question Answering. **AAAI 2018**
- [8] Huang Xin, Wei zhao, Wang Benyou, Rui Zhao. Recommendation System and Deep Learning, **Tsinghua University Press**, in Chinese, to be appeared.

2017

- [9] Zhao Wei, **Benyou Wang** et al. Leveraging Long and Short-term Information in Content-aware Movie Recommendation, in Arxiv. 2018.
- [10] Su Zhan, **Benyou Wang**, Niu Jiabin, Tao Shuchang, Zhang Peng, Song Dawei. Enhanced Embedding based Attentive Pooling Network for Answer Selection. NLPCC 2017
- [11] Wang Jun, Yu Lantao, Zhang Weinan, Gong Yu, Xu Yinghui, **Benyou Wang**, Zhang Peng, Zhang Dell. IRGAN: A Minimax Game for Unifying Generative and Discriminative Information Retrieval Models. **SIGIR 2017. Best Paper Award Honorable Mentions**
- [12] Li Jinfei. Wu Yue, Zhang Peng, Song Dawei, **Benyou Wang**. Learning to diversify web search results with a Document Repulsion Model. **Information Sciences**, 411, 136-150. 2017. (factor : 4.832)
- [13] Zhang Shengnan, Hou Yuexian, **Benyou Wang**, Song Dawei. Regularizing Neural Networks via Retaining Confident Connections. Entropy, 19(7), 313. 2017.
- [14] Shang Zhenguo, Li Jinfei, Zhang Peng, Song Dawei, **Benyou Wang**. How Users Select Query Suggestions Under Different Satisfaction States? CCIR 2017 (pp. 93-105), Springer, Cham. July, 2017.

2016 & 2015

- [15] **Benyou Wang**, et. al. A Chinese Question Answering Approach Integrating Count-Based and Embedding-Based Features. ICCPOL-NLPCC. December, 2016
- [16] **Benyou Wang**, Zhang Peng, Li Jinfei, Song Dawei, Hou Yuexian, Shang Zhenguo. Exploration of quantum interference in document relevance judgement discrepancy. Entropy, 18(4), 144. 2016.
- [17] Zhang Peng, Li Jinfei, **Benyou Wang**, et. al. A Quantum Query Expansion Approach for Session Search. Entropy, 18(4), 146. 2016.
- [18] Chen Yongqiang, Zhang Peng, Song Dawei, **Benyou Wang**. A Real-Time Eye Tracking Based Query Expansion Approach via Latent Topic Modeling. **CIKM 2015** (pp. 1719-1722). ACM. October, 2015