



# Graph Representation of the Connotations of Classical Japanese Poetic Vocabulary

Hilofumi Yamamoto, Tokyo Institute of Technology

## Can we define a connotation?



'Connotation' depends on the receiver of a message.

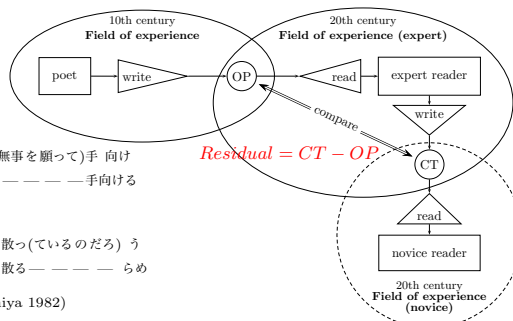
## Material

### The *Kokinshū* (ca. 905)

the first anthology compiled by the order of the Emperors.

## Relationship between OP and CT

Based on Schramm's theory of communication [source]→[encoder]→[signal]→[decoder]→[destination]



## Alignment of OP and CT

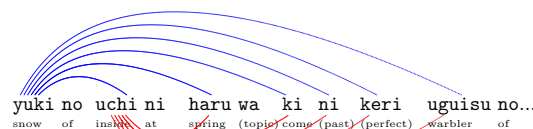
CT (秋の末近くて帰りについた) 龍田姫 (お道中の無事を願って) 手向け  
 OP ----- 立田姫 ----- 手向ける

CT (をする) 神があるからこそ秋の木の葉(か)幣(となって) 散つ(ているの) だろ う  
 OP ----- 神のあれ ば こそ秋の木の葉(の) 幣 と ----- 散る ----- らめ

CT298 translated by Teruhiko Komachiya (Komachiya 1982)

## Cooccurrence Patterns

A pattern consists of any two words appearing in a text.



Patterns may number up to 5,000.

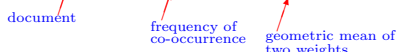
## Co-occurrence weight

Rocchio (1971)

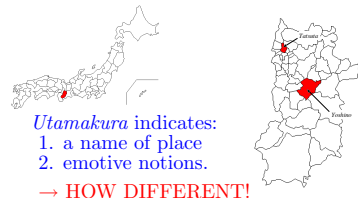
$$w(t, d) = (1 + \log tf(t, d)) \cdot idf(t)$$

Transform this for co-occurrence patterns.

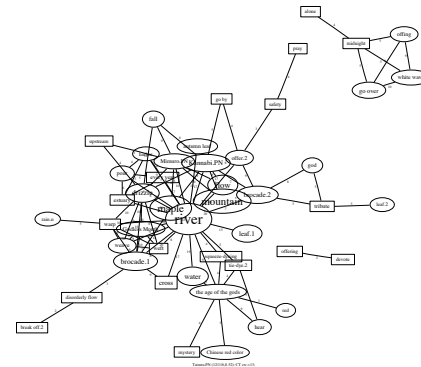
$$cv(t_1, t_2, d) = (1 + \log ctf(t_1, t_2, d)) \cdot \sqrt{idf(t_1) \cdot idf(t_2)}$$



## Targets: Tatsuta and Yoshino

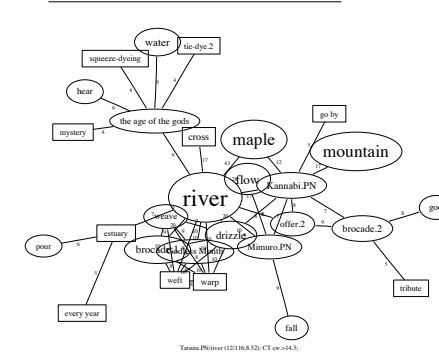


## Model of Tatsuta after pruning



KKS 994  
 as the howling winds  
 keep white waves rising in the  
 offing in the deep  
 of night is my lord crossing  
 Tatsuta Mountain alone

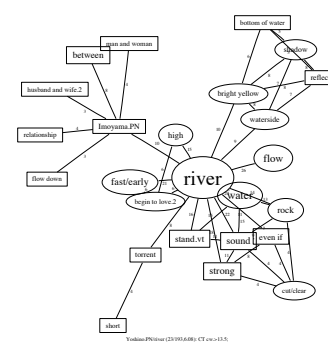
## Model of Tatsuta (river)



KKS 294  
 unheard of even  
 in the stories of  
 the age of the awesome gods —  
 the waters of Tatsuta  
 stream dyed a Chinese red

KKS 300  
 because autumn is  
 returning crossing over  
 Kannabi Mountain  
 she offers crimson prayer  
 strips at Tatsuta River

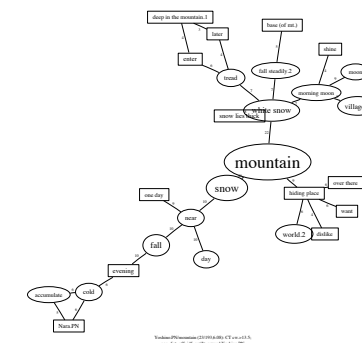
## Model of Yoshino (river)



KKS 828  
 like the Yoshino  
 River cascading between  
 Husband and Wife peaks  
 obstacles forever part  
 lovers in this world of ours

KKS 471  
 so suddenly was  
 my heart dyed with passion for  
 you it leapt high as  
 the waves in the waters of  
 the swift Yoshino River

## Model of Yoshino (mountain)



KKS 950  
 if only I had  
 a home on the far side of  
 fair Mount Yoshino  
 I would make it my refuge  
 in times of worldly sorrow

a place for hermits

## Conclusion

- Visualisation by co-occurrence patterns
- Depending on the use of words, the clusters are formed separately e.g. white waves.
- Mathematical operations using models e.g. pruning, subtracting
- Displaying connotations using CT and OP e.g. gods→Tatsuta; secular→Yoshino
- Relative saliences
- Comparison of a word between two different periods e.g. cherry blossoms at Yoshino
- Email: yamagen@ryu.titech.ac.jp

## A Sample of Model — Warbler

