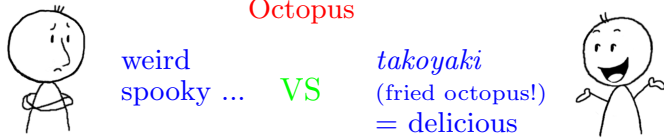


# Graph Representation of the Connotations of Classical Japanese Poetic Vocabulary

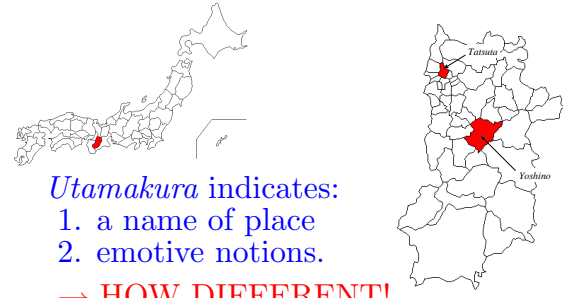
Hilofumi Yamamoto, Tokyo Institute of Technology

## Can we define a connotation?



'Connotation' depends on the receiver of a message.

## Targets: Tatsuta and Yoshino



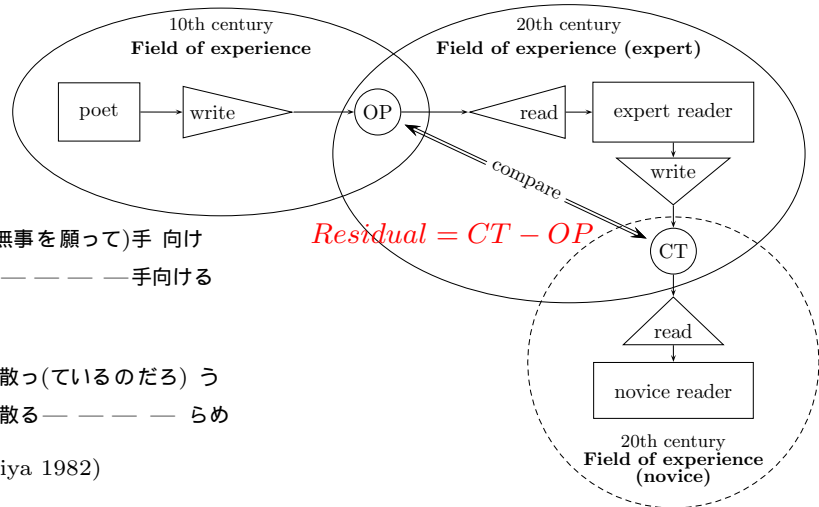
## Material

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

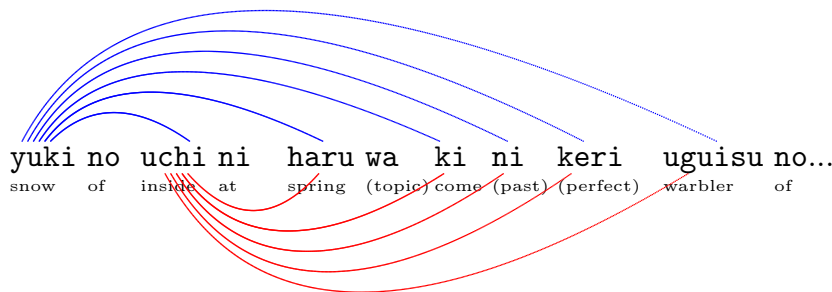
CT (秋の末近くなって帰り道についた)龍田姫(が道中の無事を願って)手 向け  
 OP ----- 立田姫 ----- 手向ける

CT (を)する神があるからこそ秋の木の葉(が)幣(となって)散っ(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.

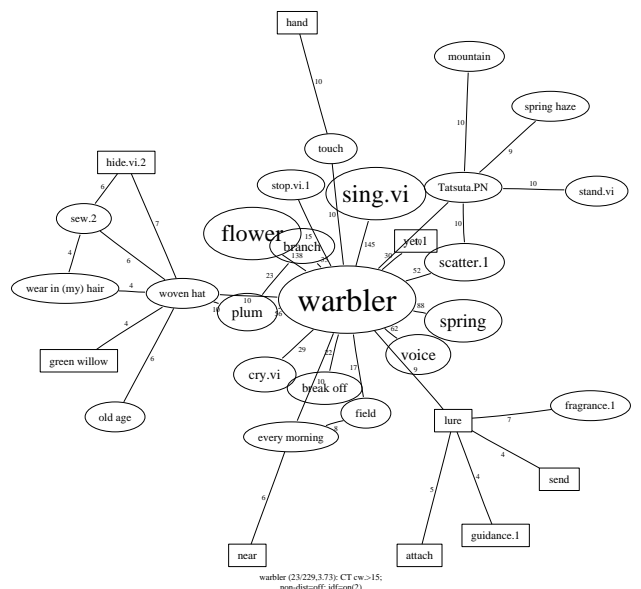
$$cw(t_1, t_2, d) = (1 + \log \frac{ctf(t_1, t_2, d)}{idf(t_1) \cdot idf(t_2)}) \cdot \sqrt{idf(t_1) \cdot idf(t_2)}$$

document

frequency of co-occurrence

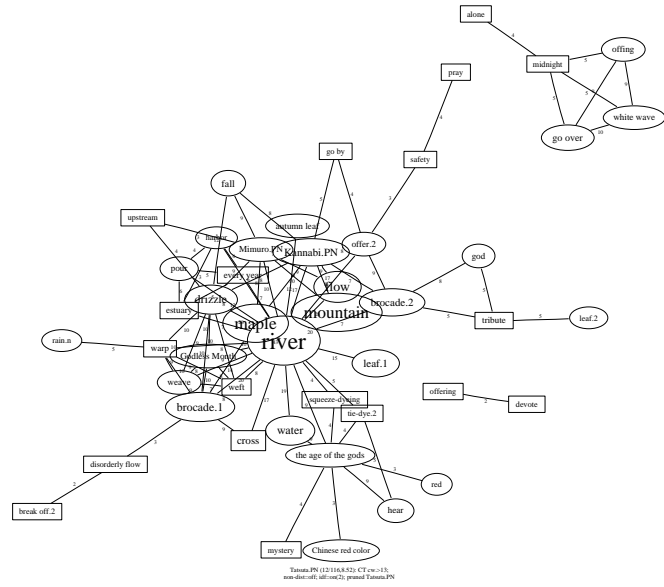
geometric mean of two weights

## A Sample of Model —Warbler



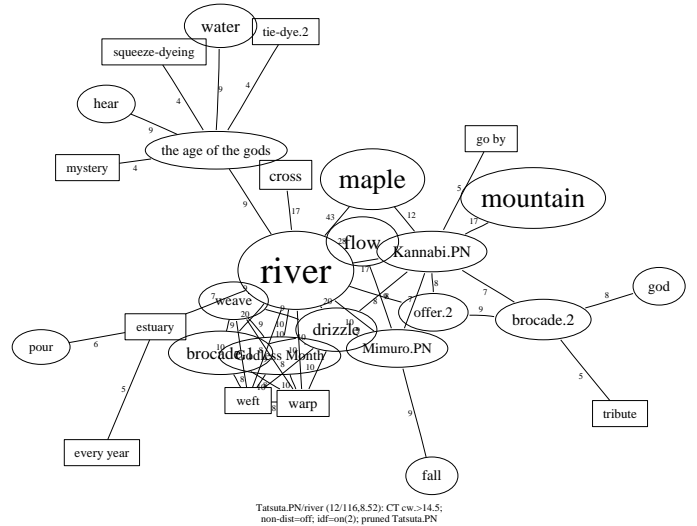
warbler (23/229,373): CT cw=15; non-dist=0; idf=0(2)

# Model of Tatsuta after pruning



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

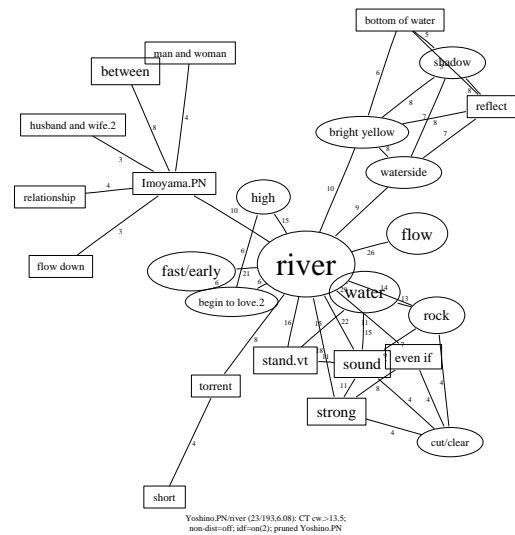
# Model of Tatsuta (river)



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**

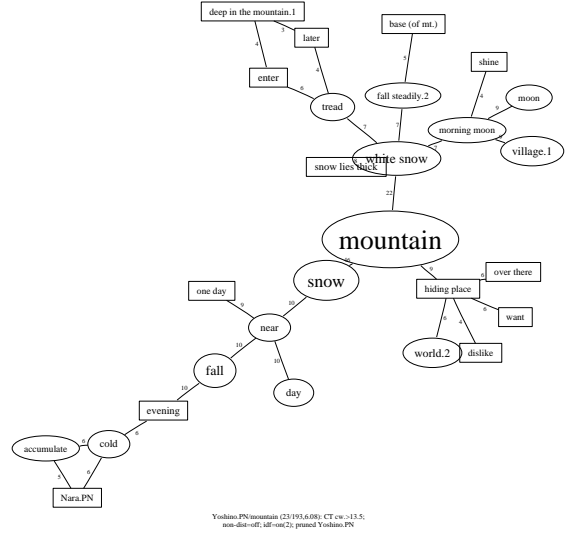
# Model of Yoshino (river)



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
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