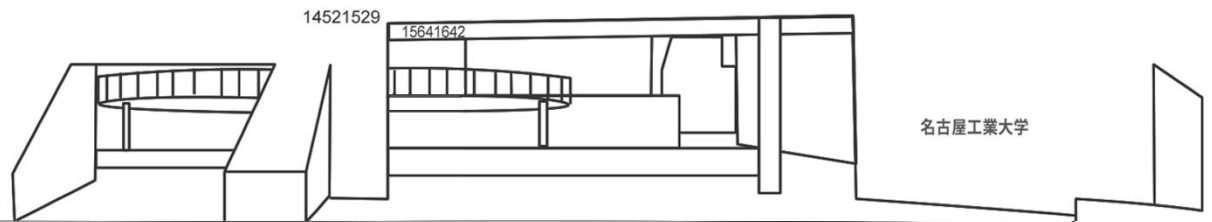


AlmostEqualAgent

◆◆◆Nagoya Institute of Technology◆◆◆ものづくり◆ひとづくり◆未来づくり◆Nagoya Institute of Technology◆◆◆

Rikuto Takano, Takeaki Sakabe,
Keiichi Namikoshi

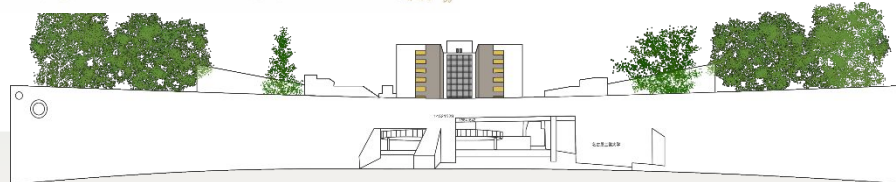
Nagoya Institute of Technology



名古屋工業大学

AlmostEqualAgent - 1st Place Winner

- We proposed **AlmostEqualAgent (AEA)** for Supply Chain Management League (OneShotTrack).
- AEA won the **1st place**, tied with CostAverseAgent and Rchan.

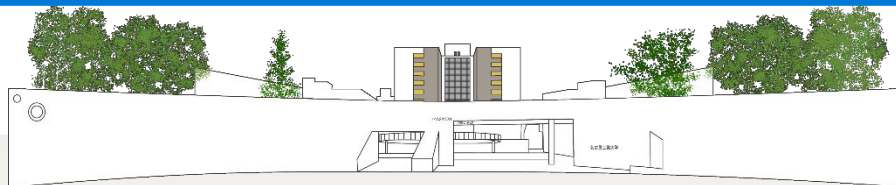


Summary of AlmostEqualAgent

- AEA is based on CautiousOneShotAgent (CA) , the 1st place in 2024.

Features of AEA

- **Offer almost equal quantity**
 - Reduce rejections and improves stability
- **Accept always considering both price and quantity**
 - Increases profit, by focusing not only on quantity but also on price

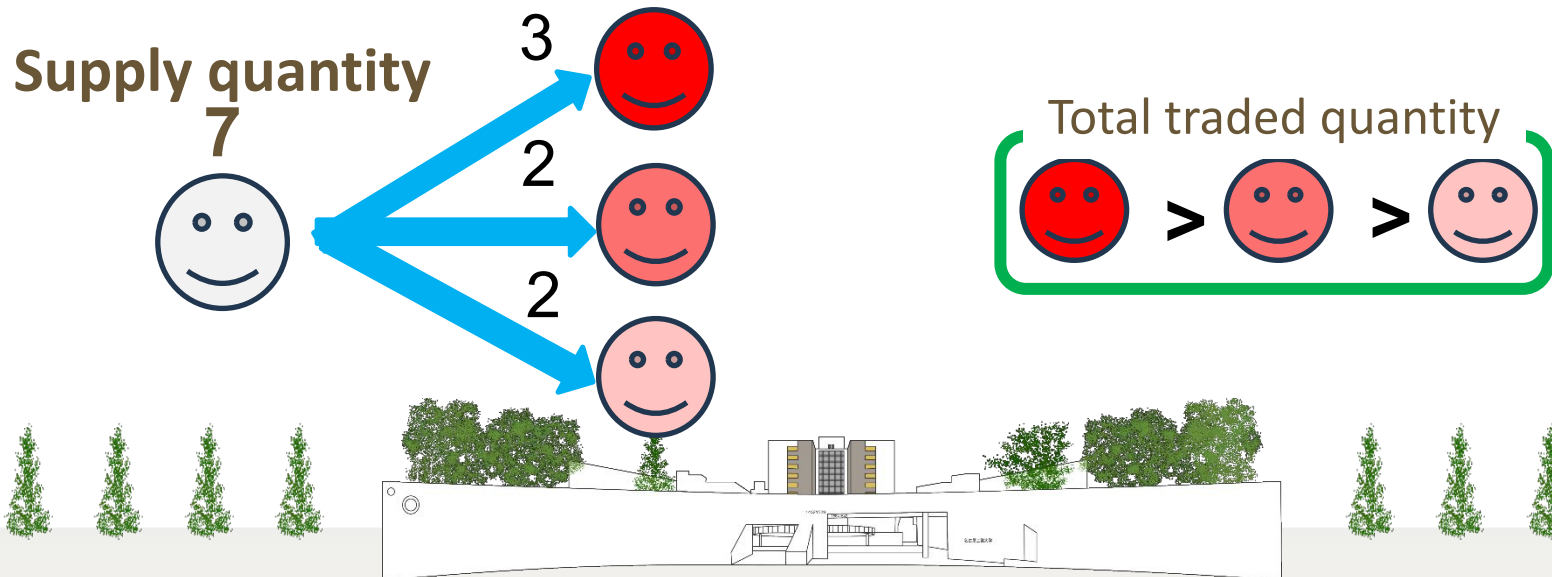


Offer Strategy (1/2)

The offer quantity is almost equal for all partners.

- In early steps, AEA offers equally.
- In later steps, AEA offers **slightly more** to partners with larger total traded quantity.

In later steps



Offer Strategy (2/2)

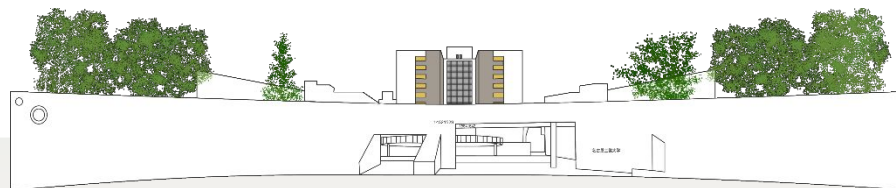
CA's later steps

Total traded quantity




proposed
AEA's later steps

- AEA offers **almost equal** quantity.
- This eliminates **extreme imbalance** in quantity and improves **stability**.



Acceptance Strategy (1/2)

- AEA considers combinations of the partner's offers.
- Optimal combination is determined by R_{score} .
 - It is determined by **normalized quantity score**, **normalized price score**, and α (= 0.85).


$$R_{score} = \alpha Q_{norm} + (1 - \alpha) P_{norm}$$


**Accept always considering
both price and quantity**

Acceptance Strategy (2/2)

AEA increases profit, by focusing not only on quantity but also on price.

and quantity (Accept the highest score combination)

 **A**(3,15)
(quantity, price)

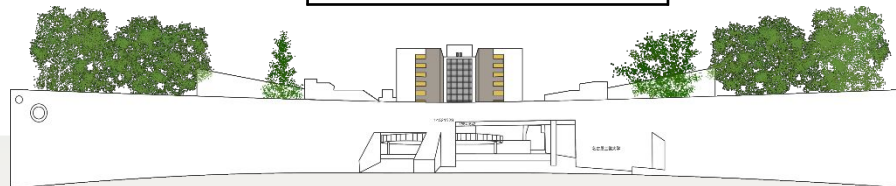
 **B**(4,16)

 **C**(5,15)

⋮
{A,B}
{B,C}
{C,A}
{A,B,C}

The highest R_{score}

➔ **Accept {B,C}**



Conclusions

- We proposed AlmostEqualAgent (AEA) based on CautiousOneshotAgent (CA).
- AEA has two main features.
 - Offer almost equal quantity
 - Accept always considering both price and quantity
- Future works:
 - We will search for a better way to sort negotiation partners in the later steps.

