

AOP Introduction

Yuta Hosokawa and Katsuhide Fujita

Tokyo University of Agriculture and Technology

Negotiation Domain

- Multiple negotiation issues
 - Each issue has multiple options
- Choose one option for each issue

Issue	Option
Destination	Tokyo
	Paris
	New York
Expenses	\$2000
	\$500

Negotiation Domain

- Multiple negotiation issues
 - Each issue has multiple options
- Choose one option for each issue

(e.g.) [Paris, \$500]

Issue	Option
Destination	Tokyo
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	New York
Expenses	\$2000
	\$500

Utility Function

- Utility function represents the agent's preferences
- “Utility” is calculated by the weighted sum of evaluation values

Issue	Weight	Option	Eval. Value
Destination	0.6	Tokyo	1.0
		Paris	0.4
		New York	0.8
Expenses	0.4	\$2000	0.3
		\$500	1.0

Utility Function

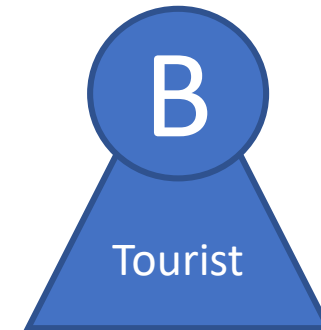
- Utility function represents the agent's preferences
- “Utility” is calculated by the weighted sum of evaluation values

(e.g.) [Paris, \$500]

$$\begin{aligned} \text{utility} &= 0.6 \times 0.4 + 0.4 \times 1.0 \\ &= 0.64 \end{aligned}$$

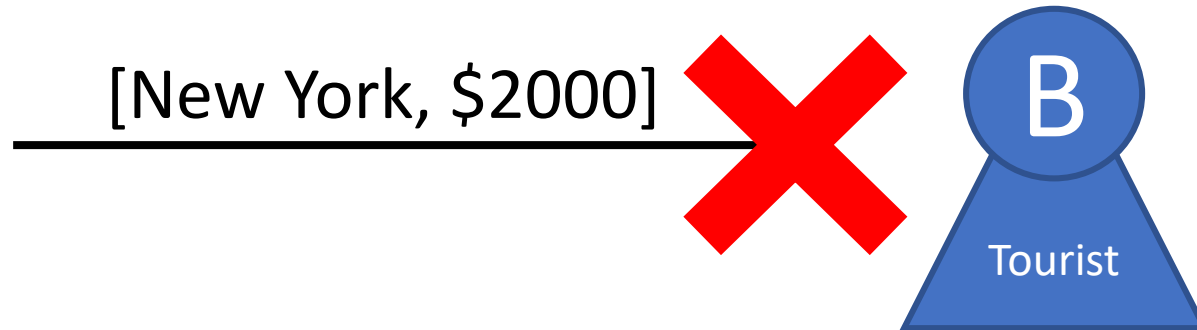
Issue	Weight	Option	Eval. Value
Destination	0.6	Tokyo	1.0
		Paris	0.4
		New York	0.8
Expenses	0.4	\$2000	0.3
		\$500	1.0

Alternating Offers Protocol



Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
0.3	Tokyo	0.3	Destination	0.6	Tokyo	1.0
0.8	Paris				Paris	0.4
1.0	New York				New York	0.8
1.0	\$2000	0.7	Expenses	0.4	\$2000	0.3
0.5	\$500				\$500	1.0

Alternating Offers Protocol



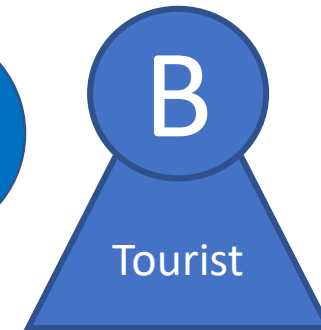
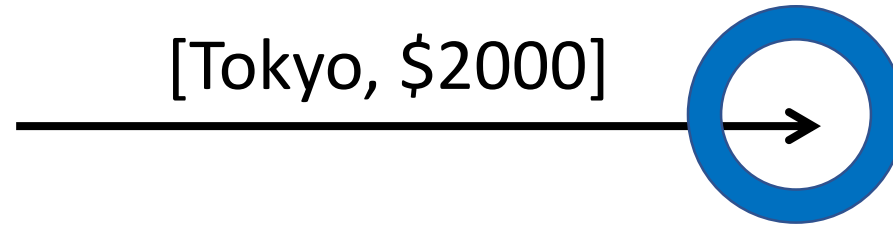
Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
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0.8	Paris				Paris	0.4
1.0	New York				New York	0.8
1.0	\$2000	0.7	Expenses	0.4	\$2000	0.3
0.5	\$500				\$500	1.0

Alternating Offers Protocol



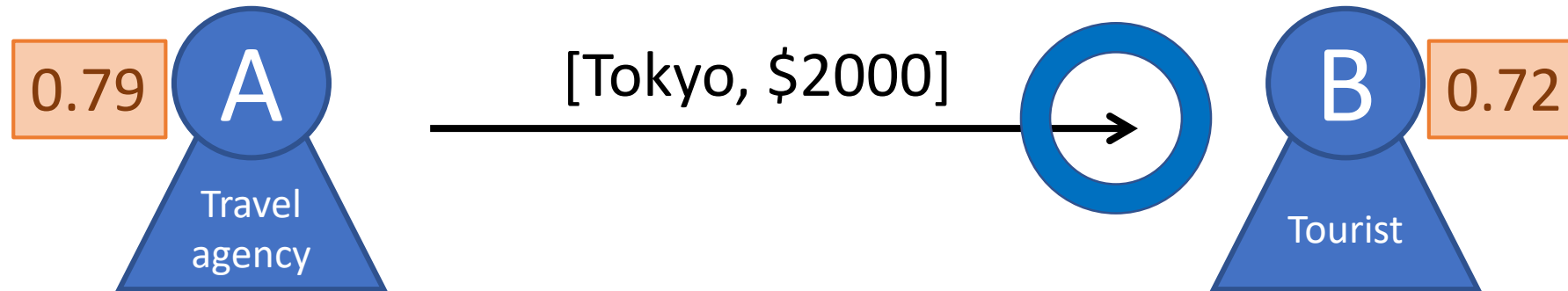
Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
0.3	Tokyo	0.3	Destination	0.6	Tokyo	1.0
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Alternating Offers Protocol



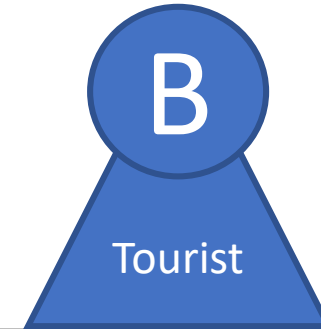
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Alternating Offers Protocol



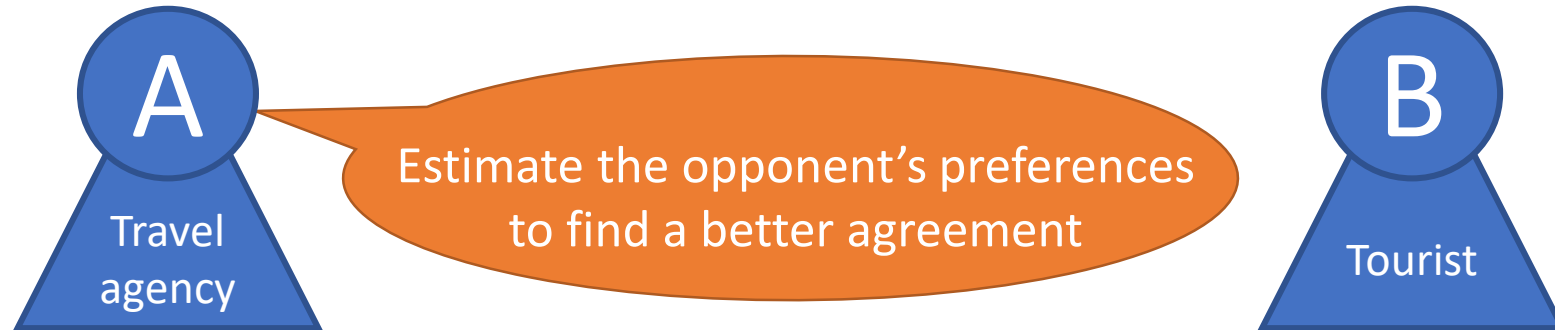
Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
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Alternating Offers Protocol



Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
0.3	Tokyo	0.3	Destination	█	Tokyo	█
0.8	Paris				Paris	█
1.0	New York				New York	█
1.0	\$2000	0.7	Expenses	█	\$2000	█
0.5	\$500				\$500	█

Opponent Modeling



Eval. Value	Option	Weight	Issue	Weight	Option	Eval. Value
0.3	Tokyo	0.3	Destination	█	Tokyo	█
0.8	Paris				Paris	█
1.0	New York				New York	█
1.0	\$2000	0.7	Expenses	█	\$2000	█
0.5	\$500				\$500	█