Preference Aggregation by Voting: Algorithmics and Complexity

Präferenzaggregation durch Wählen: Algorithmik und Komplexität

Pingo

Wintersemester 2020/2021

Dozent: Prof. Dr. J. Rothe

Website

https://pingo.coactum.de/

Access Number:
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Question 1

Suppose some voting system $\mathcal{E}$ is immune to some control type $\mathfrak{CT}$. Let $\mathcal{E}$-$\mathfrak{CT}$ be the corresponding control problem. Which of the following statements are provably true?

A $\mathcal{E}$-$\mathfrak{CT}$ is NP-hard

B $\mathcal{E}$-$\mathfrak{CT}$ is NP-complete

C $\mathcal{E}$-$\mathfrak{CT}$ is in P

D There is no provable connection between immunity of $\mathcal{E}$ to $\mathfrak{CT}$ and the complexity of $\mathcal{E}$-$\mathfrak{CT}$

Question 2

Anna, Belle:	c	a	b	d
Chris:	a	d	b	c
David:	b	d	a	c

Is it possible to partition $C = \{a, b, c, d\}$ into C_1 and C_2 such that when in the TP model the plurality winners of (C_1, V) and (C_2, V) run against each other, c is not the unique plurality winner?

A Yes, with $C_1 = \{a, b, c\}$ and $C_2 = \{d\}$

B No

C Yes, with $C_1 = \{a, c\}$ and $C_2 = \{b, d\}$

D Yes, with $C_1 = \{a, d\}$ and $C_2 = \{b, c\}$

Question 3

Anna, Belle:	c	a	b	d
Chris:	a	d	b	c
David:	b	d	a	c

Is it possible to partition $C = \{a, b, c, d\}$ into C_1 and C_2 such that when in the TE model the plurality winners of (C_1, V) and (C_2, V) run against each other, c is not the unique plurality winner?

A Yes, with $C_1 = \{a, b, c\}$ and $C_2 = \{d\}$

B No

C Yes, with $C_1 = \{a, c\}$ and $C_2 = \{b, d\}$

D Yes, with $C_1 = \{a, d\}$ and $C_2 = \{b, c\}$

Question 4

Consider an election (C, V). Which of the following statements are true?

A If c is the Condorcet winner of (C, V), then c is also the Condorcet winner of each election (C', V) with $C' \subseteq C$ and $c \in C'$

B Condorcet voting is immune to constructive control by adding candidates

C If c is the plurality winner of (C, V), then c is also the plurality winner of each election (C', V) with $C' \subseteq C$ and $c \in C'$

D Plurality voting is immune to constructive control by adding candidates

Question 5

Anna, Belle:	c	a	b	d
Chris:	a	d	b	c
David:	b	d	a	c

Is it possible to partition $V = \{\text{Anna, Belle, Chris, David}\}$ into V_1 and V_2 such that when in the TP model the plurality winners of (C, V_1) and (C, V_2) run against each other, c is not the unique plurality winner?

A Yes, with $V_1 = \{\text{Anna, Belle}\}$ and $V_2 = \{\text{Chris, David}\}$

B No

C Yes, with $V_1 = \{\text{Anna, Belle, Chris}\}$ and $V_2 = \{\text{David}\}$

D Yes, with $V_1 = \{\text{Anna}\}$ and $V_2 = \{\text{Belle, Chris, David}\}$

Question 6

Anna, Belle:	c	a	b	d
Chris:	a	d	b	c
David:	b	d	a	c

Is it possible to partition $V = \{\text{Anna, Belle, Chris, David}\}$ into V_1 and V_2 such that when in the TE model the plurality winners of (C, V_1) and (C, V_2) run against each other, c is not the unique plurality winner?

A Yes, with $V_1 = \{\text{Anna, Belle}\}$ and $V_2 = \{\text{Chris, David}\}$

B No

C Yes, with $V_1 = \{\text{Anna, Belle, Chris}\}$ and $V_2 = \{\text{David}\}$

D Yes, with $V_1 = \{\text{Anna}\}$ and $V_2 = \{\text{Belle, Chris, David}\}$

Question 7

The traffic light rules in Germany.

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The traffic light rules in Germany. Is it true that anywhere on earth there exist traffic lights . . .

A . . . where GREEN is ON TOP?

B . . . where GREEN is BLUE?

C . . . where pedestrians have YELLOW?

D . . . with horses for pedestrians?

Answer 7

The traffic light rules in Germany. Is it true that anywhere on earth there exist traffic lights . . .

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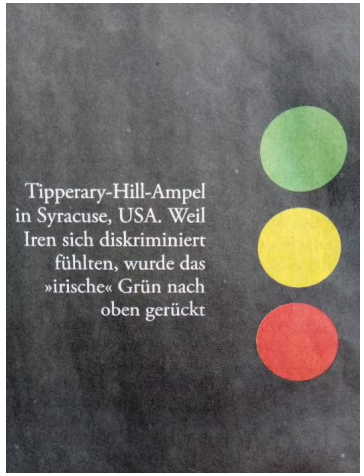

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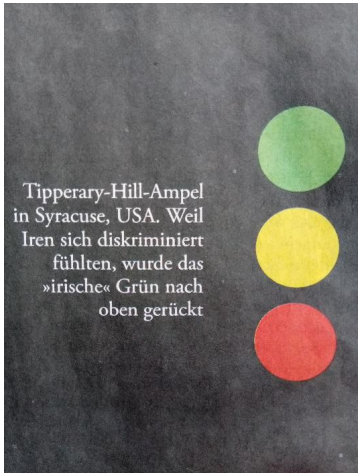

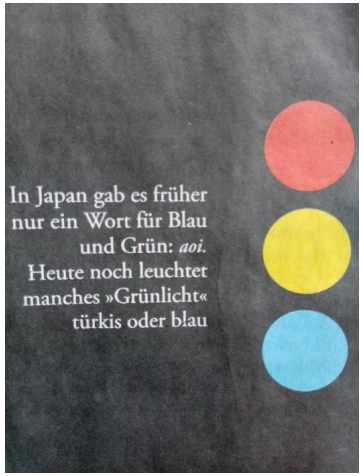

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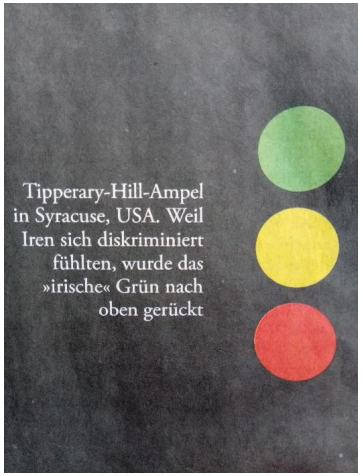

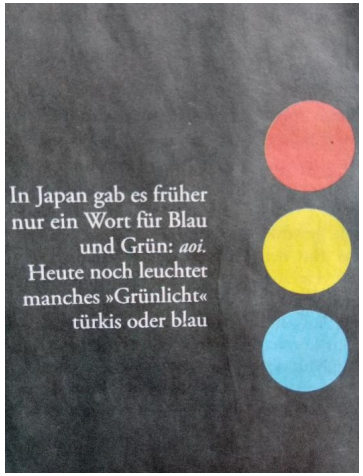

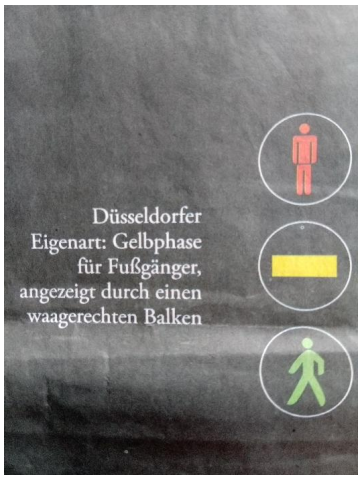

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