

Novel Pair- and Topic-Swapping

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Peer Teaching

Positives:

- Creates an active learning environment
- Encourages collaboration and communication
- Supported by education research

Challenges:

- How should students be grouped?
- How to increase communication with more classmates?

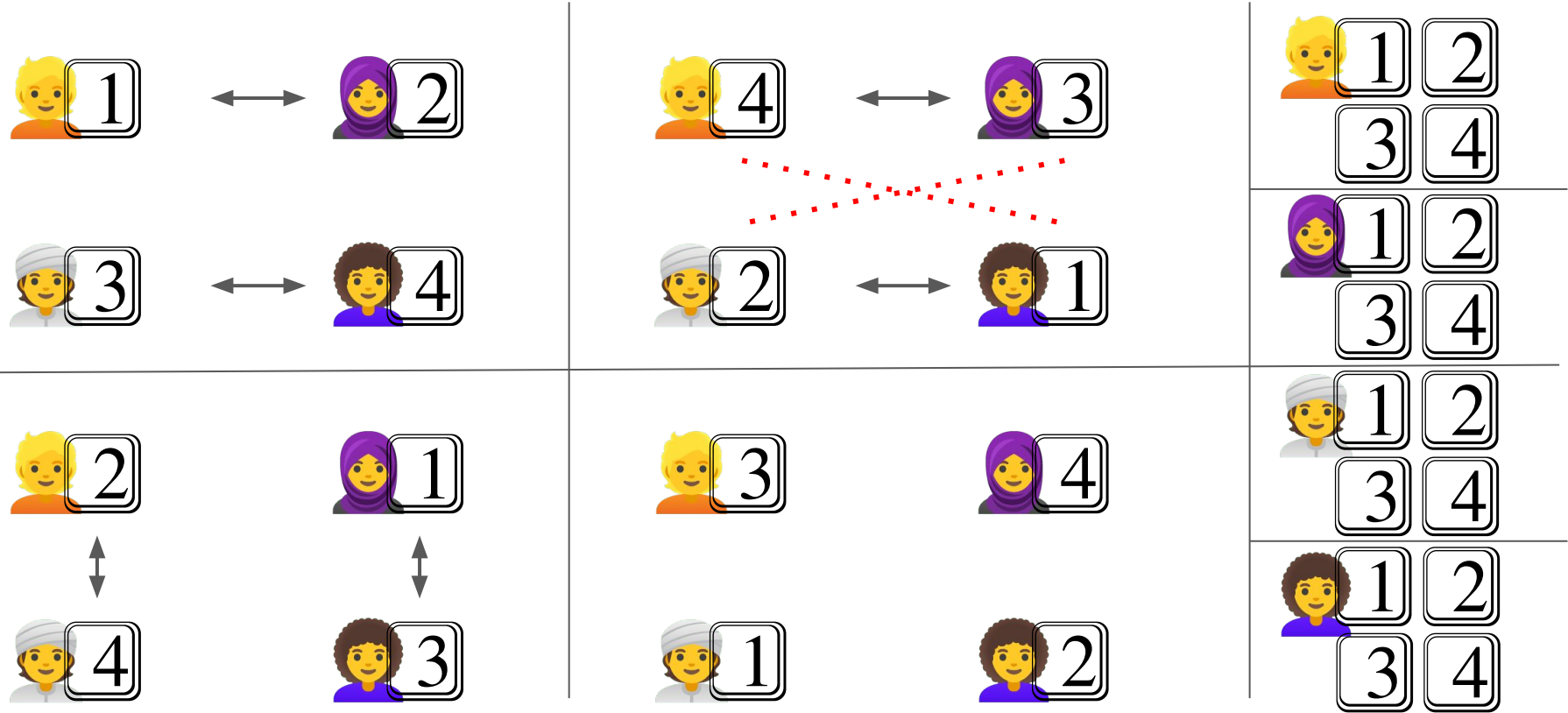
Topic-swap

- Consider s students and t topics, with $s \geq t$.
- Each student starts with a poster corresponding to a topic.
- Over at most r rounds, the students pair up, and within each pair:
 - Swaps posters
 - Acquires the topic corresponding to the swapped poster

Goal:

- Each student acquires each topic exactly once
- Each student meet as many distinct other students as possible

Example: 4 Students and 4 Topics



Model – Variables

$\text{Meet}[r, s1] = s2$: student $s1$ meets student $s2$ in round r

$\text{Topic}[r, s] = t$: student s has topic t in round r

$\text{TopicAcquired}[r, s] =$
if student s met another student $s2$ in round r ,
then $\text{Topic}[r - 1, s2]$,
else the dummy topic $\emptyset$

$\text{NumMeets}[s] =$
the number of distinct other students met by student s

$\min(\text{NumMeets})$: the objective to maximise

Model – Constraints

- Meets are symmetric
 - Equality constraints
- Topic transfer
 - Element and equality constraints
- Each student acquires each topic exactly once
 - One global cardinality per student

Additionally, fixing initial topics and first rounds

n	#topics	max #rounds	obj	time
6	4	6	2	0.137
6	6	9	3	0.354
12	6	5	5	0.297
12	8	11	7	1010.536
12	12	18	6	t/o
24	12	11	11	697.842
24	18	23	-	t/o
24	24	36	-	t/o
48	24	23	10	t/o
48	36	47	-	t/o
48	48	72	-	t/o

Thank You



Jennifer Gross



María Andreína Francisco
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Reviewer B – Pedagogics conference

“Furthermore, Constraint Programming (CP) should not be considered to be a field within AI, both because it is not a field and not within AI. It is a problem-solving paradigm that has many applications, most of which are not AI.

...

but I doubt that a regular computer wouldn't be able to handle a systematic search of the $n=12$ case, given that the problem is incredibly symmetric and highly constrained.”