

The Italian Job

Moving (massively) online a national Olympiad

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Introduction

Italian Olympiad in Informatics selection phases

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Phase I

Phase II

Phase III

Conclusions

The selection of the Italian team for IOI N follows these phases:

Phase	Selection level	Name	Period	# people
I	<i>School</i>	<i>Scolastiche</i>	Nov–Dec $Y - 2$	10k–15k
II	<i>Regional</i>	<i>Territoriali</i>	Apr–May $Y - 1$	1k–2k
III	<i>National</i>	<i>Nazionali</i>	Sep $Y - 1$	~ 100
IV	<i>Training camps</i>	<i>Volterra</i>	Oct $Y - 1$ — May Y	20–30

All selection phases have been moved online for this last year due to the pandemic.



Phase I

School-level selection

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How it was structured:

- paper-based exam with multiple-choice and numerical-answer questions;
- administered and evaluated by a teacher in each high school.

How it was moved online:

- students take the test at home without a supervisor;
- there are only numerical-answer questions with multiple versions for each;
- the order of the questions is randomized;
- each student receives a unique *PDF* file, generated by *randomTEX*;
- the answers are collected through a *Google Form*.



Phase II

Regional-level selection

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How it was structured:

- *Facebook Hacker Cup*-like contest with immediate feedback and partial scores;
- there are ~ 50 regional hubs, usually high schools, where the contest is held;
- each hub is provided with a preconfigured VM of a *Terry* server instance;
- a teacher is selected for each hub to watch over the contest and report results.

How it was moved online:

- once again, students compete at home without supervision;
- there are multiple *Terry* server instances, students are allocated between them;
- better question management was added to *Terry*;
- *Starplag* was developed as an anti-cheating measure.



Phase III

National-level selection

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How it was structured:

- an *IOI*-like contest, with just one contest day, held in one place;
- the contest management system used is *CMS*.

How it was moved online:

- students compete from their home, using a VM, but are proctored;
- each student shares their webcam and microphone with a staffer;
- students cannot leave the VM, and have to run *Oll-proctor* on their machines;
- the VM blocks internet access and records the screen, uploading it in real-time.

Phase IV contests were managed similarly to the *National* one.



Conclusions

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We successfully moved all phases of the *Italian Olympiad in Informatics* online and developed useful tools along the way.

The tools we developed can be found at the following addresses:

- *randomTEX*: <https://github.com/olimpiadi-informatica/randomtex>
- *Terry*: <https://github.com/algorithm-ninja/terry>
- *Starplag*: <https://github.com/olimpiadi-informatica/starplag>
- *Oll-proctor*: ask us about it at info@olimpiadi-informatica.it



Thank you!