Informatics Europe
Awards Ceremony 2021

Best Practices in Education Award

Award Committee Chair:
Jean-Marc Jézéquel
IRISA / University of Rennes, France

Sponsored by
Best Practices in Education Award
“Cybersecurity”

Award Committee:
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Gabriela Marcu, University of Michigan, US
Elisabetta Di Nitto, Politecnico di Milano, Italy
Alexander Pretschner, TU Munich, Germany
Lili Nemec Zlatolas, University of Maribor, Slovenia

Sponsored by
Microsoft
Informatics Europe
2021 Best Practices in Education Award

Presented to

Cybersecurity National Laboratory CINI

in recognition of the outstanding educational initiative on “Cybersecurity”
The *Training Chain* of the CINI Cybersecurity National Lab.
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What’s it

https://cybersecnatlab.it
What’s it

The Academic “Leg” of the Italian Cybersecurity Ecosystem

https://cybersecnatlab.it
What’s it

- One of the National Labs of

https://cybersecnatlab.it
A consortium of 49 Italian Universities that:
- do research in CS/CE
- deliver BS, MS, PhD degrees
- are public funded
Training Chain
Program aimed at fostering and encouraging the approach to cybersecurity of students of ALL years of ALL high schools.
The Program

Registrazioni online
Feb 08 - Mar 12, 2021

Test di ammissione
Mar 15, 2021

Percorso di addestramento
Mar 22 - Mag 28, 2021

Competizione nazionale
Giu 12, 2021

Cerimonia di premiazione
Giu 14, 2021
Registrations to the 1st edition, in 2021

- The pilot project involved:
  - 184 high schools
  - 80 Italian provinces in 18 regions
  - 1,112 students enrolled
  - 250 students admitted to the training course
National Competition – Saturday June 12\textsuperscript{th}, 2021

- 318 Participants
- 7 hours of competition
- 16 challenges
- 1,523 submissions
- 464 resolutions
Additional returns for participants

For all

- OpenBadge
- Soft skills
- Game-based Assessment
- Training portal
Additional returns for participants

For all

- OpenBadge
- Soft skills
- Game-based Assessment
- Training portal
New Training Portal

https://training.olicyber.it/

All the training material developed within OliCyber is freely accessible through the new Training Portal of the Cybersecurity National Lab.
New training material

- Material completely in Italian and organized in 8 weeks of training
- 16 hours of lectures on various cybersecurity topics
- Prepared by experts
New hands-on challenges

150+ challenges on the most important cybersecurity topics:
Excellence training

The training and the development of the training material was supported by the 10 best Italian Capture-the-Flag teams, composed of CyberChallenge.IT participants and members of the Italian National Cyberdefender TeamItaly.
The winners of the CyberChallenge.IT and OliCyber.IT programs will be included in the INDIRE national register of excellence.

Economic rewards for the winners

https://www.indire.it/eccellenze/
Training Chain
First Italian training program in cybersecurity for high-school and university students (aged 16-24)
Why?

- Creating and growing a *community of cyber defenders* by investing in young talents
Why?

- Creating and growing a *community of cyber defenders* by investing in young talents
- Tackling the *workforce shortage*
World-wide workforce shortage

The Need

$170B
In worldwide cybersecurity spending by 2020

3.5M
Projected unfilled jobs worldwide by 2021

2.5M
Data breaches worldwide 2017

https://cyber-nyc.com
Why?

- Creating and growing a *community of cyber defenders* by investing in young talents
- Tackling the *workforce shortage*
- Raising *awareness & cyber culture*
# CyberChallenge.IT – Some Data

<table>
<thead>
<tr>
<th>Year</th>
<th>Venues</th>
<th>Schools</th>
<th>Participating students</th>
<th>Admitted</th>
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<tbody>
<tr>
<td></td>
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<td>Signed in</td>
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<tr>
<td>2017</td>
<td>1</td>
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<td>683</td>
<td>603</td>
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<td>2018</td>
<td>8</td>
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- System Action
- Training Path
- Training Materials & Platforms
- Free of charge
- Additional Returns for Participants
System Action

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System Action

- The program has been made possible by the nature of the National Lab.
- No single Italian university would have had the capability to realize it by its own, reaching today levels.
System Action

- Significant role in Europe
Training provided by national completion organizer with respect to time and number of participants trained for ECSC - 2020

The CyberChallenge.IT program is in first place as students participating in the project and in the first places for the duration of the training program.
Training provided by national completion organizer with respect to time and number of participants trained for ECSC - 2020

The CyberChallenge.IT program is in first place as students participating in the project and in the first places for the duration of the training program.
Number of participants in national cyber security competitions

<table>
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<tr>
<th>Country</th>
<th>Signups</th>
<th>Active users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td>600</td>
<td>250 (40 &quot;very&quot; active)</td>
</tr>
<tr>
<td>Cyprus</td>
<td>157</td>
<td>65</td>
</tr>
<tr>
<td>Czech Republic</td>
<td>Over 5,000</td>
<td>From 3,000 to 4,500</td>
</tr>
<tr>
<td>Estonia</td>
<td>300</td>
<td>100</td>
</tr>
<tr>
<td>France</td>
<td>2,000</td>
<td>-</td>
</tr>
<tr>
<td>Germany</td>
<td>770 (junior and senior category)</td>
<td>200 (junior and senior category)</td>
</tr>
<tr>
<td>Greece</td>
<td>50</td>
<td>-</td>
</tr>
<tr>
<td>Ireland</td>
<td>390</td>
<td>-</td>
</tr>
<tr>
<td>Italy</td>
<td>4,452</td>
<td>518</td>
</tr>
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<td>4,900 (as 2021)</td>
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</tr>
<tr>
<td>Malta</td>
<td>20</td>
<td>-</td>
</tr>
<tr>
<td>Netherlands</td>
<td>145</td>
<td>145</td>
</tr>
<tr>
<td>Norway</td>
<td>158</td>
<td>55</td>
</tr>
<tr>
<td>Poland</td>
<td>77</td>
<td>38 (solved at least one challenge)</td>
</tr>
<tr>
<td>Portugal</td>
<td>42</td>
<td>-</td>
</tr>
<tr>
<td>Romania</td>
<td>500</td>
<td>250</td>
</tr>
<tr>
<td>Spain</td>
<td>1,792</td>
<td>168</td>
</tr>
<tr>
<td>Switzerland</td>
<td>1,000</td>
<td>200-100</td>
</tr>
<tr>
<td>Total</td>
<td>17,363*</td>
<td>1,989*</td>
</tr>
</tbody>
</table>

The CyberChallenge. IT program involves more than 25% of total European signups and active users of all training programs in the European Union
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➢ System Action

➢ **Training Path**

➢ Training Materials & Platforms

➢ Free of charge

➢ Additional Returns for Participants

➢ Workflow:

➢ Admission Tests

➢ Training path

➢ Final competitions
Training Path

- 12 weeks
- 1 module / week

Key Role of Gaming
Training Path

- 12 weeks
- 1 module / week
- Key Role of Gaming

Areas:
- Introduction to Cybersecurity
- Cryptography
- Hardware Security
- Software Security
- Network Security
- Web Security
- Attack/Defense
- Ethics & Soft Skills
Training Path

1. 12 weeks
2. 1 module / week

Key Role of Gaming

Areas:
- Introduction to Cybersecurity
- Cryptography
- Hardware Security
- Software Security
- Network Security
- Web Security
- Attack/Defense
- Ethics & Soft Skills

New Areas for the 2022 edition:
- CanBus
- OsInt
- Malware Analysis
- Machine Learning
- Adversarial Attacks
Some data for the 2021 edition

- **Challenges (practice problems/exercises):**
  - 62,000+ attempted resolutions
  - 23,500+ correctly solved by 750 participants
Final competitions

- *Capture-the-Flag:*
  - Local competitions:
    - Jeopardy
  - National competition:
    - Attack-Defense

CTF Finals: Chiavari (Ge), June 27, 2019
STELMILIT Compound
- System Action
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Teaching materials

- All in English
- Is systematically:
  - revised (during the preparation phase)
  - updated (after each edition)
- Targets both BlueTeaming and RedTeaming
Platforms

- In-house availability of ALL the platforms for:
  - Admission Tests
  - Training
  - Jeopardy Competitions
  - Attack/Defence Competitions
  - Portal & Site

- Continuous upgrades
- High standards in terms of:
  - Quality
  - Security
  - Dependability
- All available with several deployment solutions
PAIDEUSIS (Παιδευσις)

- **Hybrid CyberRange** that each student can access for *Network* and *Hardware security* training
Current equipment:
- 4 servers, with 200+ USB interfaces for VMs
- 40 modems/routers
- 40 Open security Platforms
- 40 Platforms for Side Channel attacks
- 40+ platforms for IoT and IIOT
- SCADAs & ICS’
- CanBus’s
- ...
PAIDEUSIS (Παίδευσις)

CyberRange ibrido cui ciascuna sede può accedere gratuitamente per il training di Network e Hardware security.
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CyberRange ibrido cui ciascuna sede può accedere gratuitamente per il training di Network e Hardware security.
PAIDEUSIS (Παιδευσις)

- Systematically used for national CtF competitions, both Jeopardy & Attack/Defence, with hundreds of participants
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Free of charge

- Student participation is completely FREE
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- **Additional Returns for Participants**
  - Open Badges
  - Carrier Opportunities
Carrier Opportunities

- Credits (ECTS) recognized by several Italian Universities and High Schools
- Continuous link with private companies and public institutions
CyberChallenge.IT availability

- If any University/Institution is interested in joining / adopting CyberChallenge, please contact me!!
Training Chain
TeamItaly

- The *National Cyber-defender Italian Team*
- It attends international competitions, such as the *European Cybersecurity Challenge - ECSC*
2019 European Championship

ECSC 2019 – Bucharest, October 8-11
2019 European Championship
2019 European Championship
TeamItaly 2020

- 20 people call-up to the national team
- Completely remote bootcamp
- Team Building training remotely
- European Championship: just a friendly match
TeamItaly 2021
TeamItaly 2021

First woman to join TeamItaly
TeamItaly 2021

Winner of OliCyber.IT 2021, the youngest member of the team (17 years old)
TeamItaly 2021

- Bootcamp in presence, in Turin, at the ITC-ILO ONU Center, from 5 to 12 September
Ritiro in presenza, a Torino, presso ITC-ILO, dal 5 al 12 settembre.
Team’s Kit
Team Building & Soft Skills activities
Technical Training
Scelti i 10 giovani hacker etici del team italiano di cybersecurity

Il Team Italy parteciperà alla European cybersecurity challenge, le gare per decretare la miglior squadra di hacker in Europa, a Praga dal 28 settembre all’1 ottobre
2021 European Championship
2021 European Championship
TeamItaly 2024

- We shall organize in Italy the European Championship !!!
Training Chain
Goals:

- activate a network among the High Schools
- create an intermediate level of training and interaction with students
- Contribute to the growth of a community of professors increasingly aware of issues related to cybersecurity
CyberHighSchools

- **Goals:**
  - activate a network among High Schools
  - create an intermediate level of training and interaction with students
  - Contribute to the growth of a community of professors increasingly aware of issues related to cybersecurity

*Up to now, 190 federated High Schools*
Courses for teachers

- Free courses for high school teachers
  - Introduction to Cybersecurity
  - Training for the Olympics OliCyber
Courses for teachers

- *Free courses for high school teachers*
  - Introduction to Cybersecurity
  - Training for the Olympics OliCyber

100 registrations in just 2 days!!
Training Chain
Training Chain

So far we didn’t get a single cent of public funding !!!!!!!!!!!!!!
Training Chain

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All self-funded thanks to
- Contributions from Nodes
- Private sponsors
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https://cybersecnatlab.it