Mentoring talent in IT security – A case study

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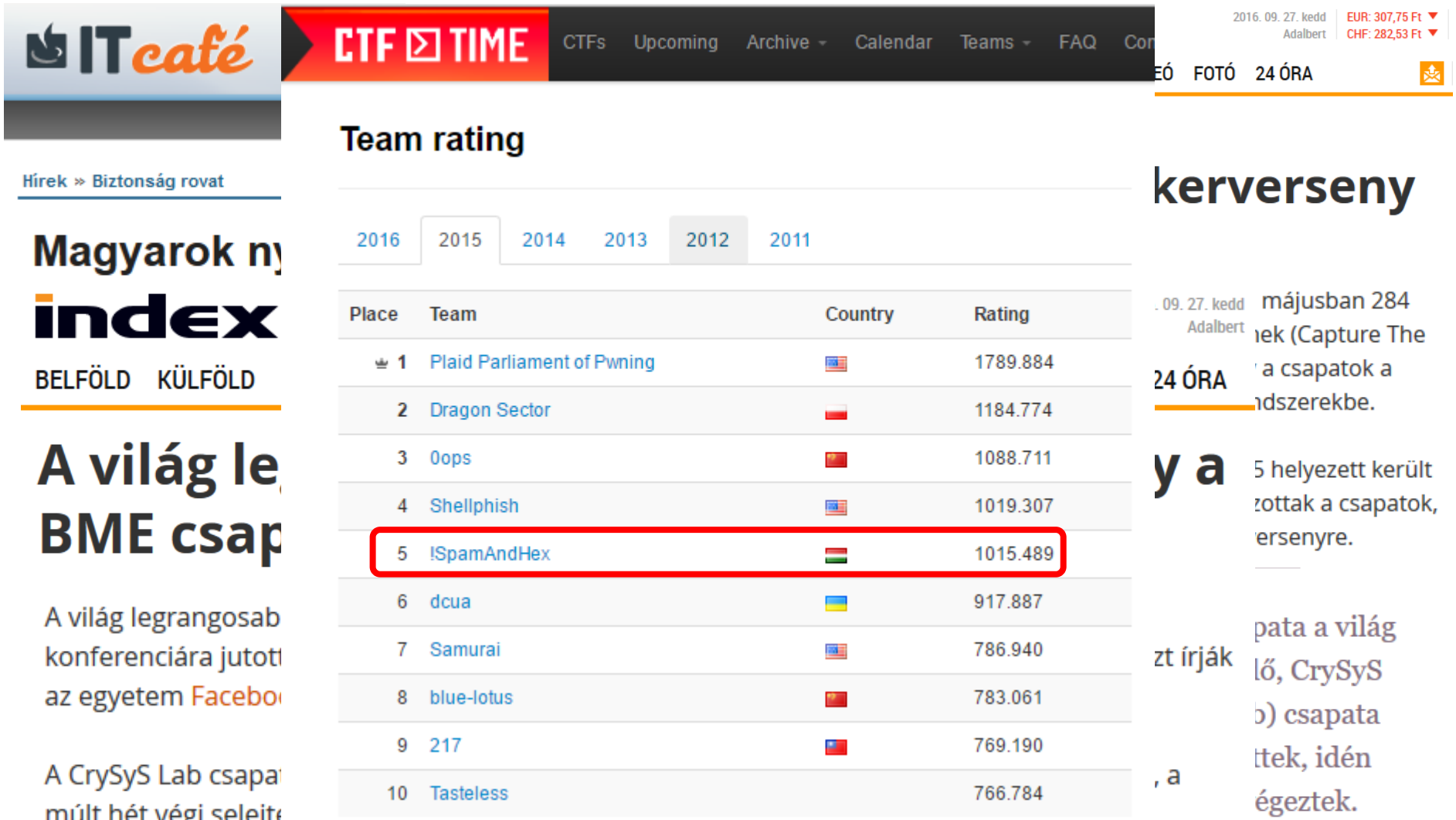
this is joint work with **Gábor Pék, Márk Félegyházi,** and **Boldizsár Bencsáth**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What's the magic secret to success?

The CrySyS Student Core

The CrySyS Student Core

- an invite-only group of students who are enthusiast and who have already proved their aptitude for IT security

- how to get invited?
  - score among the best students at our CrySyS Security Challenge
  - provide an impressive performance during a student semester project

Operation of the Core

- weekly meetings (including the holiday seasons)
  - a member presents work he has done recently
  - joint preparation for CTF games
    - discuss tutorials and write-ups
    - solve challenges from previous years

Operation of the Core

- members really enjoy to be part of the Core
  - develop unique knowledge and skills
  - feel good in a social sense
  - have independence and responsibilty

Operation of the Core

- faculty members minimize their control on the Core
  - attract and prepare interested students
  - advise the selection of new Core members
  - acquire financial support for the operation of the group

The Core is a *community of practice*

”a group of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly” -- Etienne Wenger,1991

1. a shared domain of interest
2. joint activities and information sharing
3. development of a shared ”repertoire of resources”

Efficiency by *situated learning*

”learning that takes place in the same context in which it is applied”

- learning through the relationships between people
  (in a community of practice)
- learning by doing
  (under some supervision)
- better understanding
- more efficint for hands-on skills
  (than lectures)

Sustainability needs a program

visibility

bootstrapping

speeding up

admission

intergration

giving back

Sustainability needs a program

visibility

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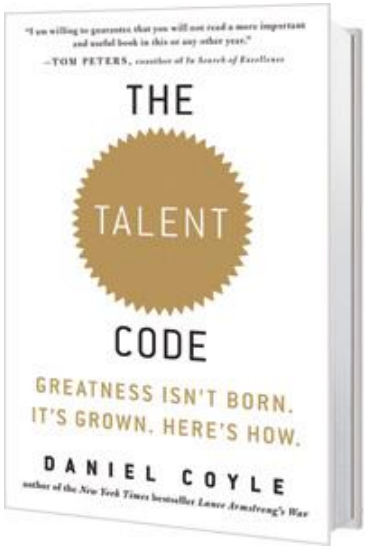
integration

giving back

- we get in touch with students early in their curriculum
- we create igniting moments
  - raise interest in IT security
  - give the necessary force and endurance for diligent practice



Sustainability needs a program

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giving back

- starting an activity in IT security is difficult
  - too much information available
  - experimenting may be illegal
- we organize a bootcamp
  - a set of selected topics
  - lot of hands-on exercises

Sustainability needs a program

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- we provide opportunities for further develpment
  - **avatao** challenges
  - possibility for newbies to join the !SpamAndHex CTF team
  - involvement in projects

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- we demand performance for admission to the Core
  - students feel that they achieved something
  - it is a privilege to belong to the group

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- usually an organic process
- we ask newcomers to give a talk on their special know-how
  - creates their status in the group
  - helps engaging in discussions and building relationships
- new members are involved in the CTF activity

Sustainability needs a program

visibility

bootstrapping

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admission

integration

giving back

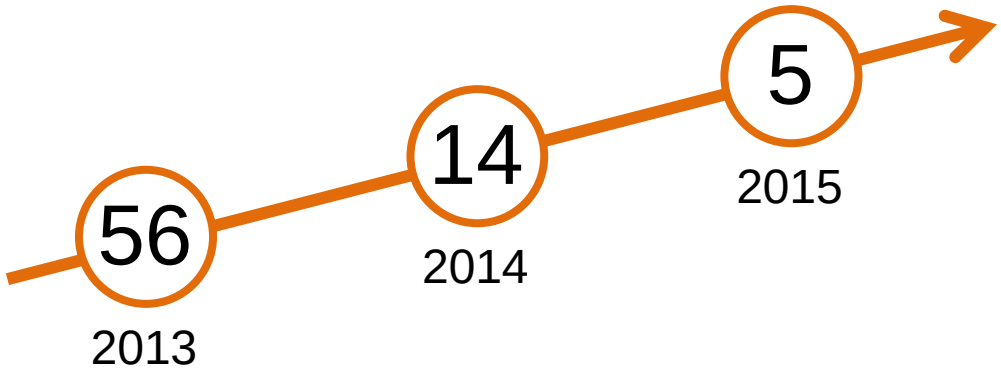
- Core members actively participate in training aspiring students
  - supervising bootcamp sessions
  - developing challenges for the annual CrySyS Sec Challenge

Success is measurable

DefCon CTF finalist (2015, 2016)

2 UCSB iCTF 2013	2 EKOPARTY CTF 2015	4 ASIS CTF Quals 2015	7 RuCTFE 2015
1 UCSB iCTF 2014	7 HITCON CTF 2015 Final	1 ASIS CTF Finals 2015	3 RuCTF Finals 2016
3 Nuit du Hack CTF Finals 2014	3 CONFidence CTF 2015	6 Hack.lu CTF 2015	6 Belluminar 2016

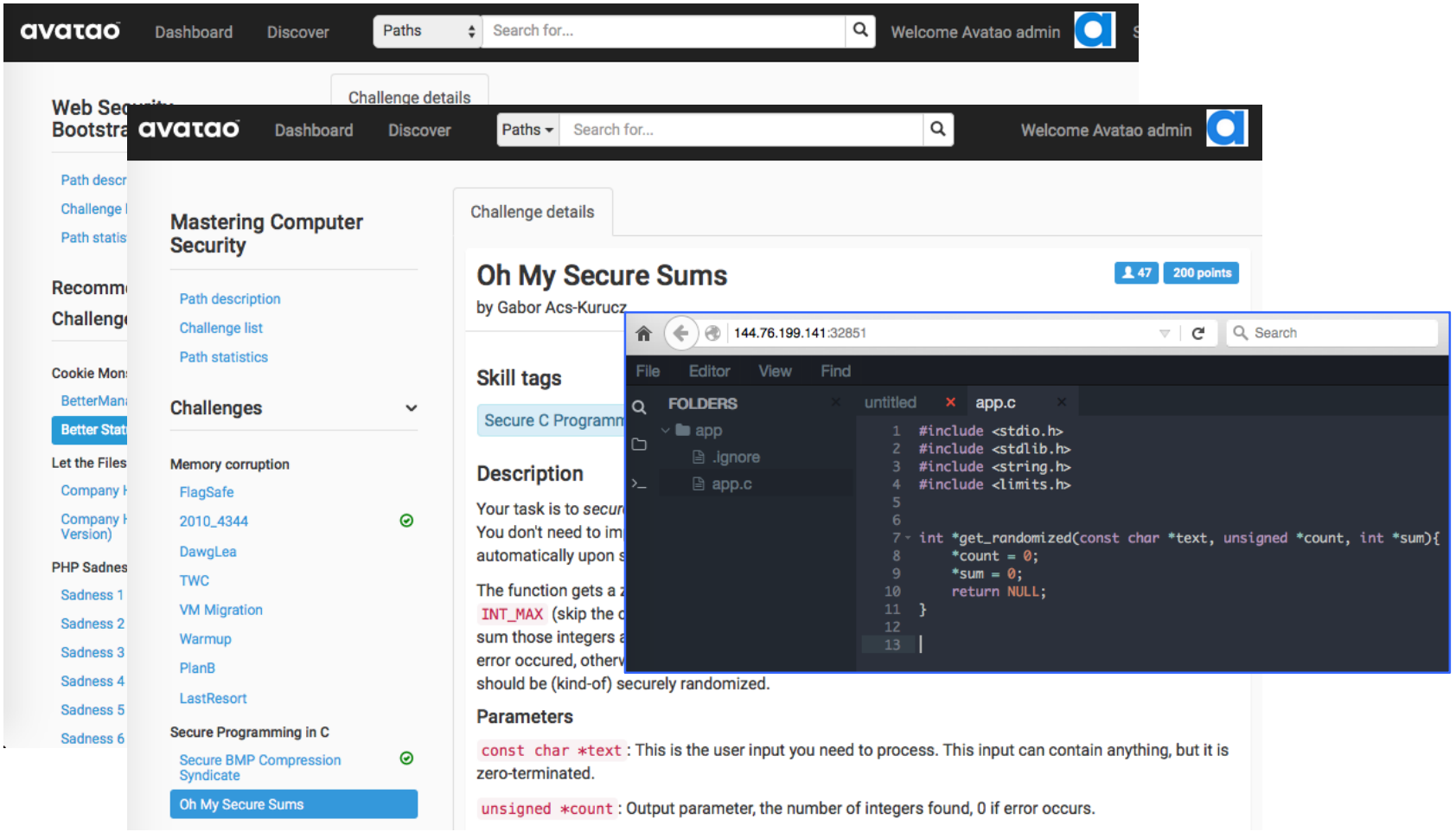
CTF TIME



avatao offers hands-on IT security exercises for people to sharpen their skills

the most recent spin-off from the CrySyS Lab

avatao – on-line IT security exercises



avatao – advantages

- convenient for students
  - **no need to install** anything, it just works
  - potential solutions can be submitted and there's **immediate response**
  - if something goes wrong, just **re-start any time** the exercise
  - many exercises have a **step-by-step solution guide**

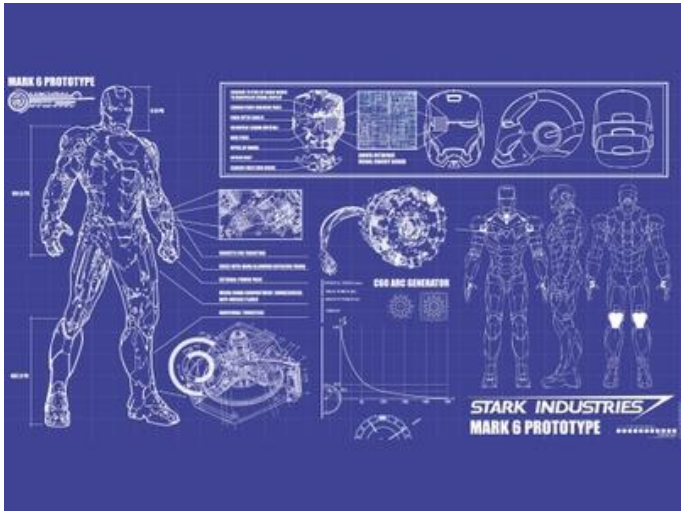
- offers great opportunities for teachers
  - **no need for infrastructure** to set up and maintain
  - there are already **250+ exercises** (and growing)
  - it takes just a **few minutes to create a new path**
  - can be used for **homeworks, lab exercises, exams, CTFs, ...**
  - **free access** by contributing new content

Conclusions

- IT security courses in the university curriculum are designed for the average students
- special attention is needed to identify outstanding students, make them interested in IT security, and help them grow their talent

Conclusions

- our program is based on
  - the CrySyS Student Core
  - 6 steps to ensure sustainability
- we heavily use avatao as a tool
  - in the ignition, bootstrapping, speeding up, admission, and giving back phases
- our success is measurable
- our blueprint can be copied



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