

# impress

## Improving Engagement of Students in Software Engineering

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ERASMUS+

Project 2017-1-NL01-KA203-035259

# **mpress** : about the project

An EU-funded project aiming at improving students' engagement in Software Engineering courses through gamification.



<https://impress-project.eu/>

# Software is everywhere

In short, software is eating the world

— Marc Andreessen —

# Failing software is everywhere



2017 stats effects:

(3.7 billion people)

\$1.7 trillion in assets



**LOSSES FROM SOFTWARE FAILURES (USD)**

# 1,715,430,778,504

ONETRILLIONSEVENHUNDREDFIFTEENBILLIONFOURHUNDREDTHIRTYMILLIONSEVENHUNDREDSEVENTY-EIGHTTHOUSANDFIVEHUNDREDFOUR

 **TRICENTIS**



Consequences of failing software get worse





# The Coming Software Apocalypse

# Software engineering stakeholders

- \* Customers want to have **quality** products
- \* Bosses want to make **money**
- \* Engineers want to **program** wonders



# Software engineering stakeholders

- \* Customers want to have **quality** products
- \* Bosses want to make **money**
- \* Engineers want to **program** wonders

What should we teach  
students?



# Teaching/learning programming is fun

- \* Create something!
- \* Solve puzzles!
- \* See it work!
- \* Different solutions



Lego



Scratch

Pex (Microsoft)



# Software engineering

- \* Customers want to have quality products
- \* Bosses want to make money
- \* Engineers want to program wonders

But..... engineers should not only program  
They also need to **test** the modules they build  
... and invest in **formalizing** the modules' **specification**

# Not only programming...

## we need to teach software engineering

- \* waterfall, iterative, agile
- \* requirements, architecture, ....
- \* 14 UML diagram types
- \* 23 design patterns
- \* over 80 refactorings
- \* Testing
- \* Security
- \* ....
- \* ...
- \* ...



**For example**





**For example**





- Can gamification improve the engagement in SE courses?
- Different level of gamification:
  - Gamified class room SE quizzes
  - SE education games
- Two additional aspects: integrated analytics and AI/automation to reduce teachers' effort.



## OUTPUT 1 : Quizzes

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## OUTPUT 2: Games to learn testing

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[code-defenders.org](http://code-defenders.org)

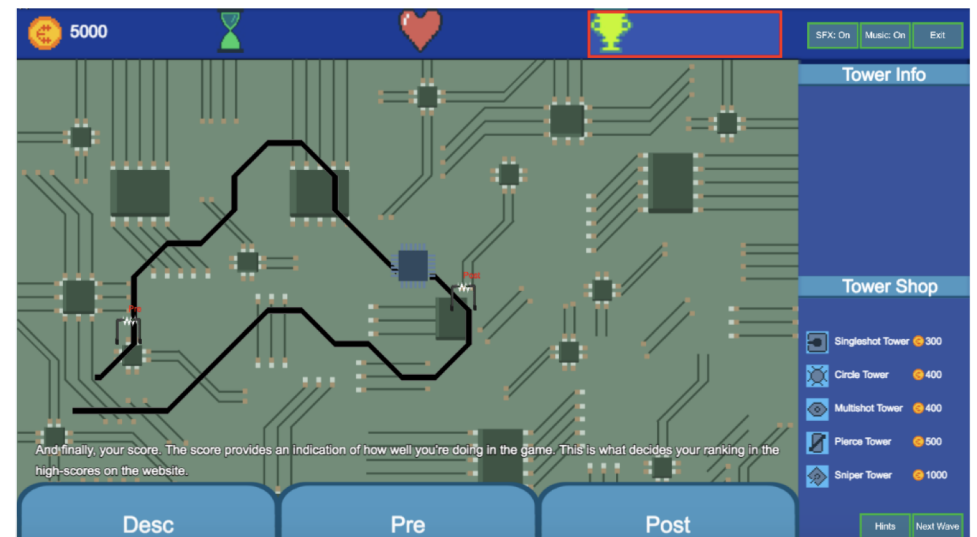
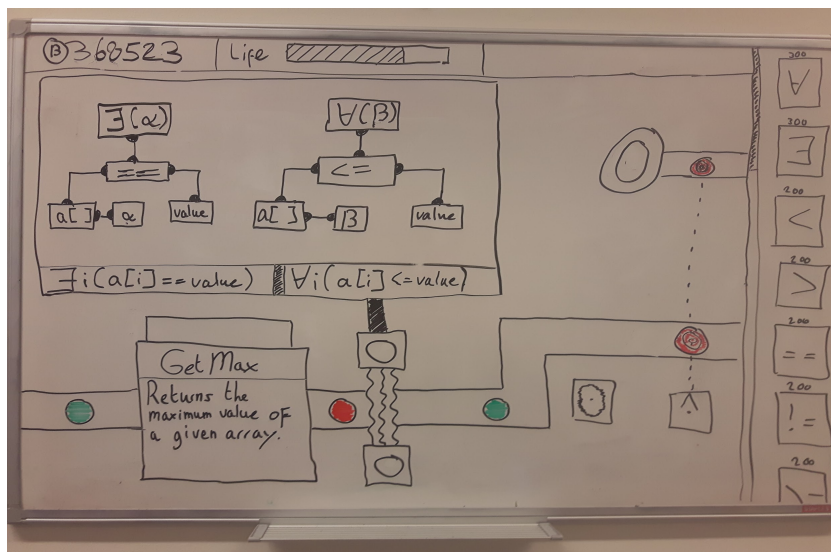




OUTPUT 2:

Games to learn to write formal specifications

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OUTPUT 3:

Studying these innovations in actual class rooms

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- \* Morning session: teachers
- \* Afternoon session: students
- \* Lunch at 13:00





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