University POLITEHNICA of Bucharest

Faculty of Automatic Control and Computers

Computer Science and Engineering Department

Portability and Interoperability Features in **Robocheck**
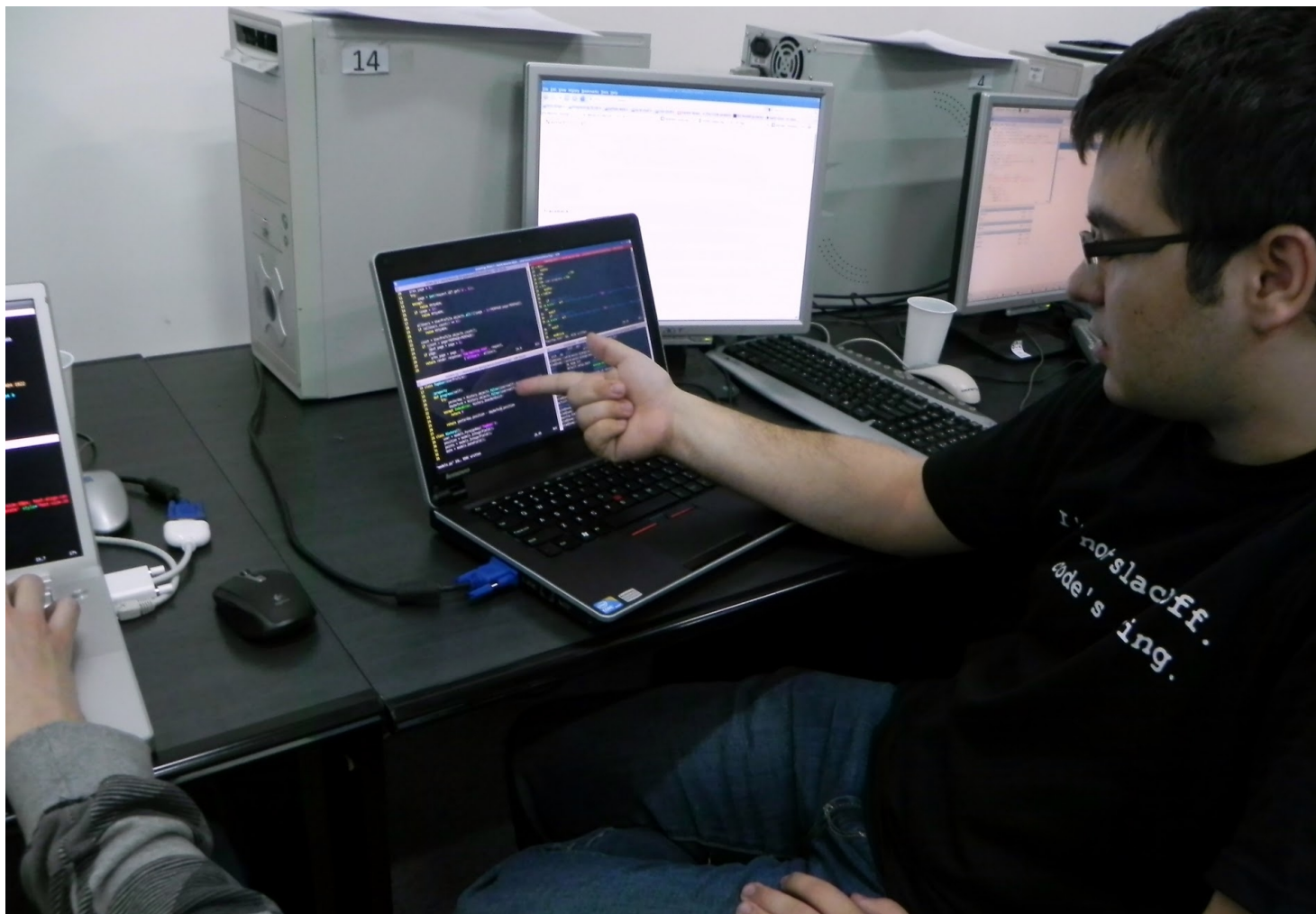
Bachelor Presentation Session - September 2012

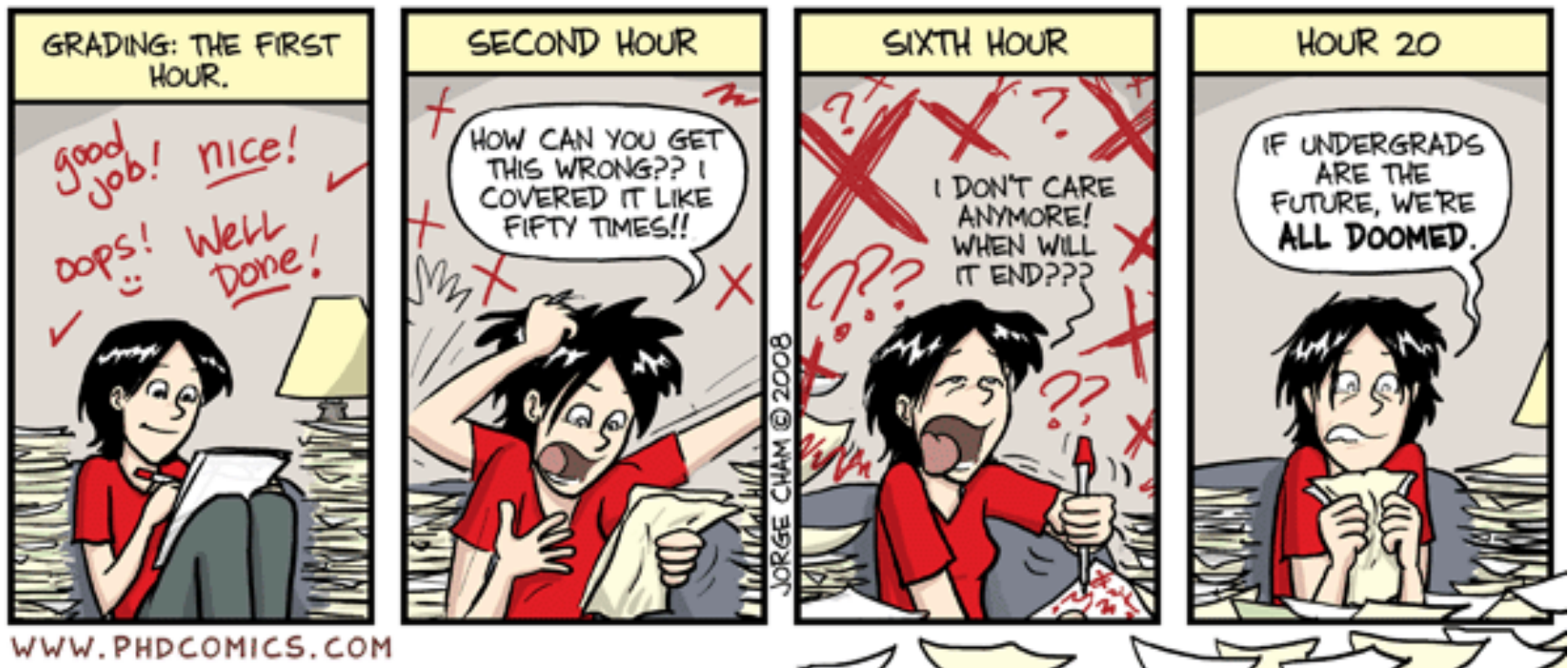**Scientific Adviser**

as. dr. ing. Răzvan Deaconescu

Author

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Context and Motivation
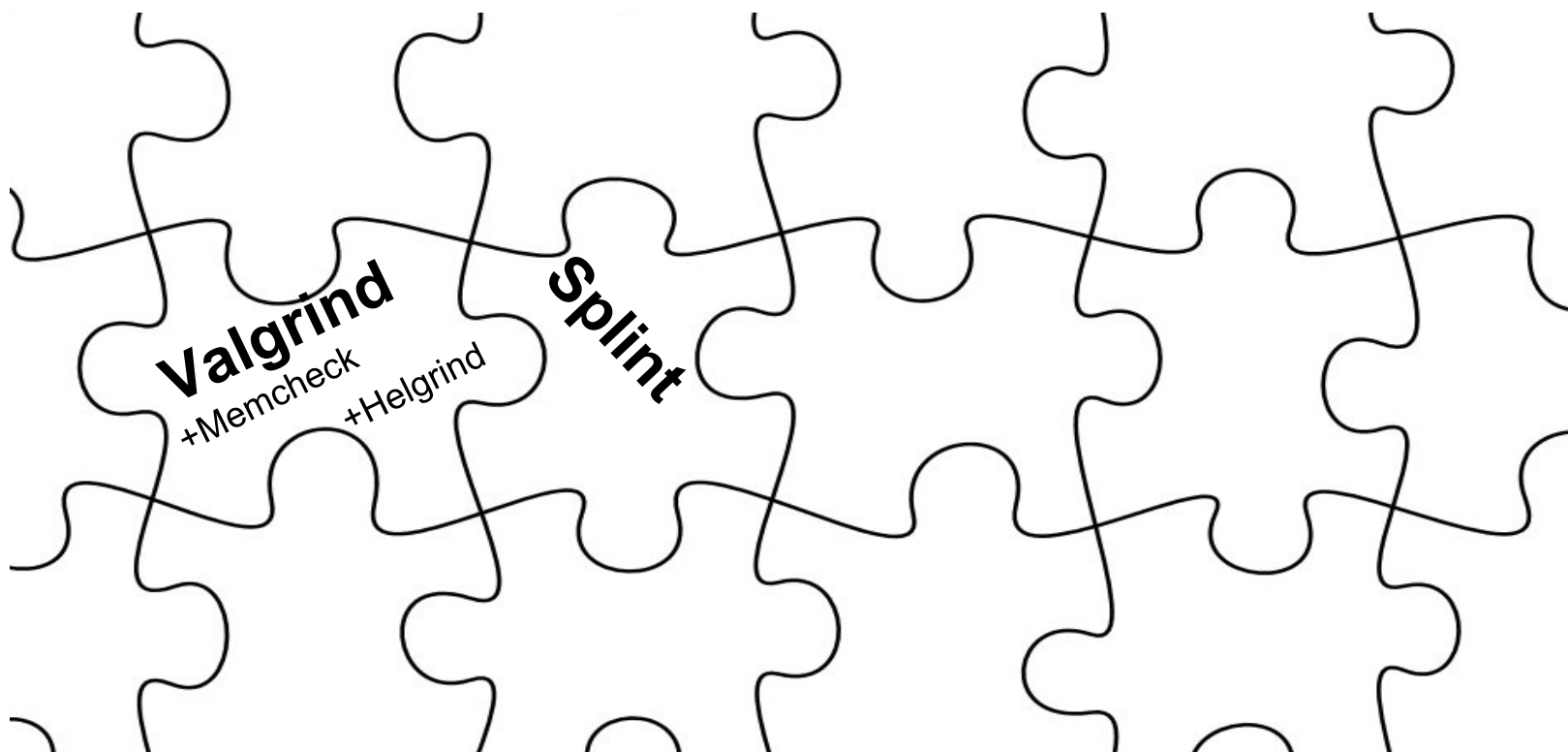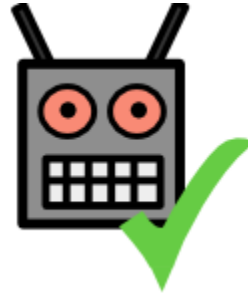
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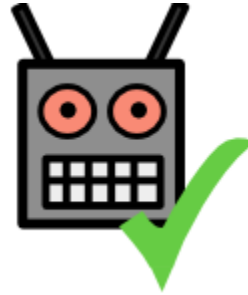# Context and Motivation
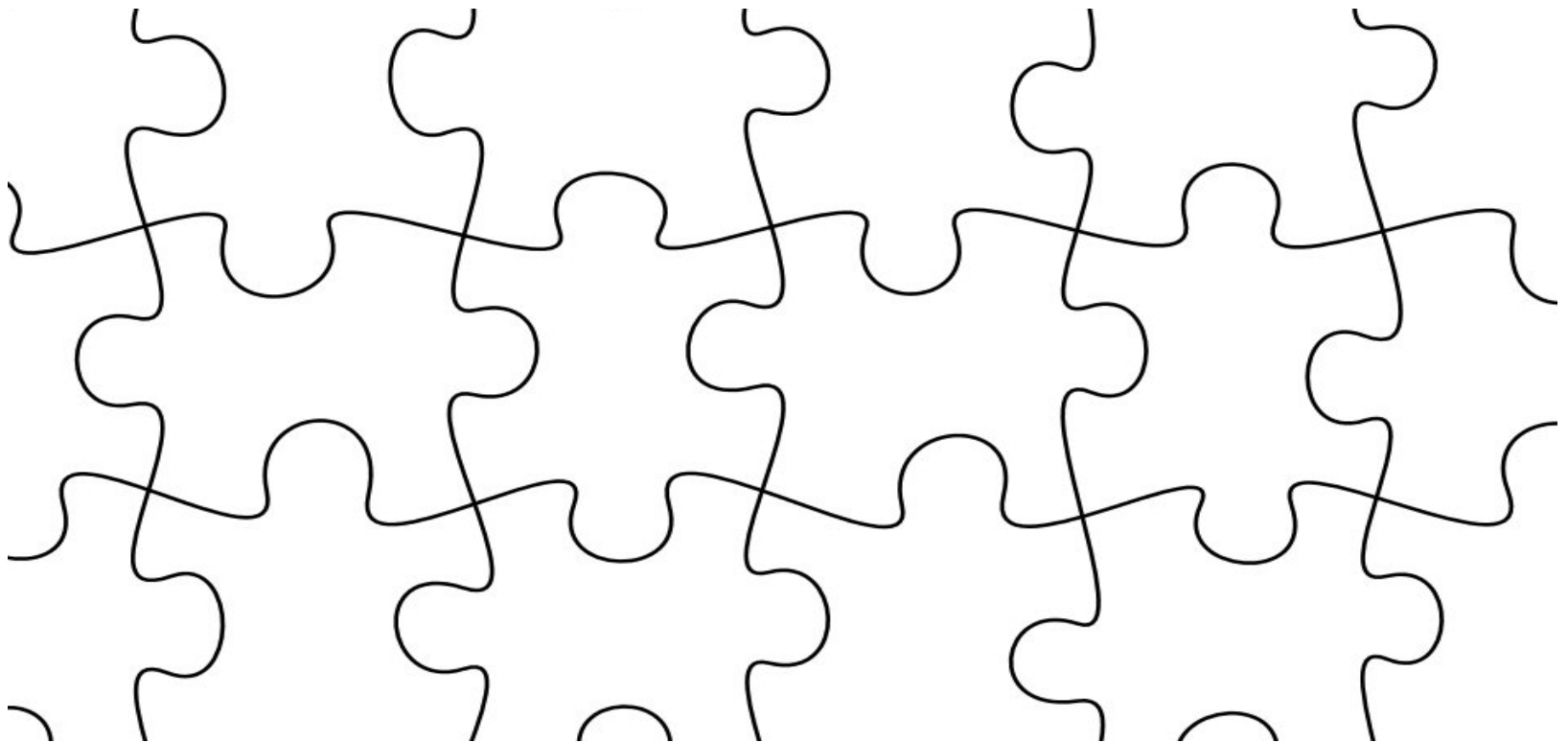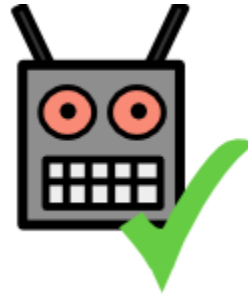
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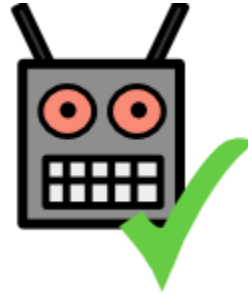# Context and Motivation

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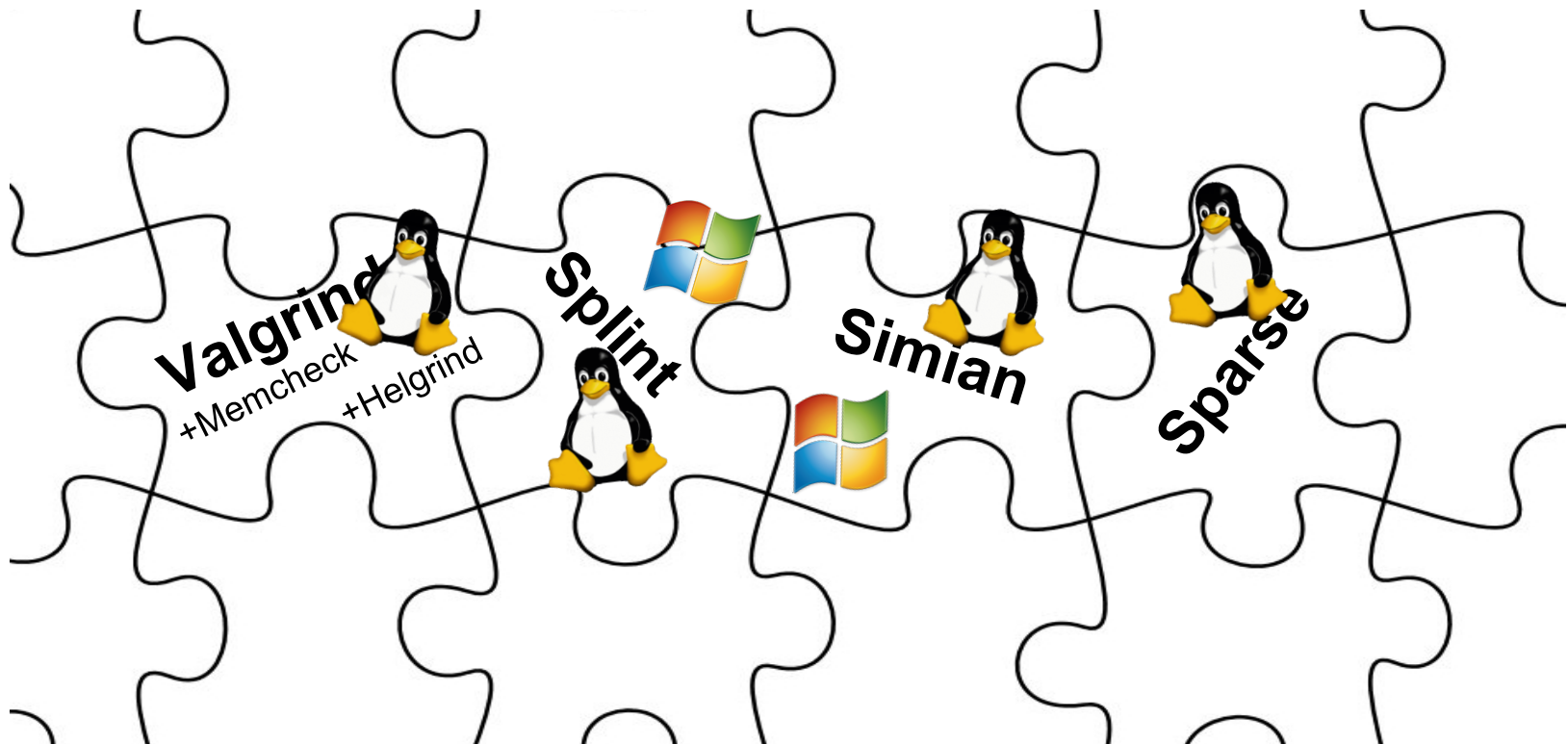
Context and Motivation

Project Proposal

Project Proposal

- solve usability issues
  - expand Splint module with other error types
  - modify Simian parser
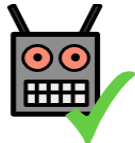
Project Proposal

- ## solve usability issues
  - ○ expand Splint module with other error types
  - ○ modify Simian parser

- ## simplify configuration process
  - ○ tool for generating configuration file instead of XML edit

Project Proposal

- solve usability issues
  - expand Splint module with other error types
  - modify Simian parser

- simplify configuration process
  - tool for generating configuration file instead of XML edit

- provide portability for Windows platform

Project Proposal

- ## solve usability issues
  - ○ expand Splint module with other error types
  - ○ modify Simian parser

- ## simplify configuration process
  - ○ tool for generating configuration file instead of XML edit

- ## provide portability for Windows platform

- ## integrate ROBOCHECK with vmchecker

Porting Robocheck to Windows

Porting Robocheck to Windows

● find suitable libraries

Porting Robocheck to Windows

- find suitable libraries
- C89 vs. C99

Porting Robocheck to Windows

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Result: Robocheck runs on Windows!

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What about Memcheck ?

Porting Robocheck to Windows

What about Memcheck ?

Porting Robocheck to Windows

Dr. Memory

- an alternative to Valgrind/Memcheck
  - reduced execution time
- Open Source project
- runs both on Linux and Windows

Robocheck Interoperability

Robocheck Interoperability

- unified error reporting mechanism

Robocheck Interoperability

- unified error reporting mechanism
- easy to parse output (JSON)

Robocheck Interoperability

```json
{
  "result":
  [
    {
      "name" : "Memory leak",
      "key" : "New memory leak modification",
      "value" : "0.30",
      "where" :
      [
        { "line" : "In function IndexOf, in file darray.c, at line 144" },
        { "line" : "In function Remove, in file darray.c, at line 163" },
        { "line" : "In function Delete, in file darray.c, at line 197" }
      ]
    },
    {
      "name" : "Duplicate code",
      "key" : "Duplicate code in sources",
      "value" : "0.20",
      "where" :
      [
        { "line" : "Duplicate lines: darray.c[165-188]  darray.c[199-222]" }
      ]
    }
  ]
}
```

Robocheck Interoperability

Robocheck Interoperability

- ## creates testing environment
  - ○ VMware, LXC, KVM
  - ○ any operating system

Robocheck Interoperability

- ## creates testing environment
  - ○ VMware, LXC, KVM
  - ○ any operating system

- ## runs testing scripts

Robocheck Interoperability

- ● creates testing environment
  - ○ VMware, LXC, KVM
  - ○ any operating system

- ● runs testing scripts

- ● used for 4 years in CSE Department
  - ○ Programming in C, USO, SD, PA, RL, SO, SO2, CPL

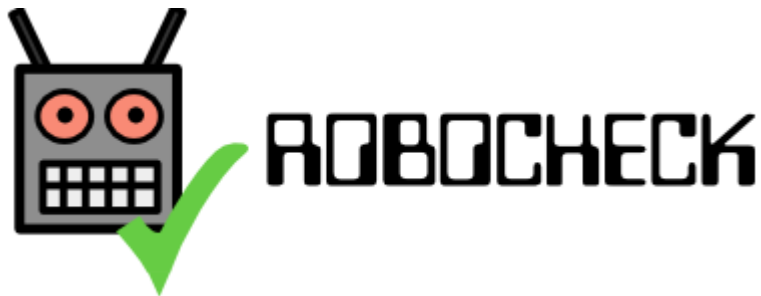## Robocheck Interoperability

Robocheck Interoperability

vmchecker

- run Robocheck

ROBOCHECK

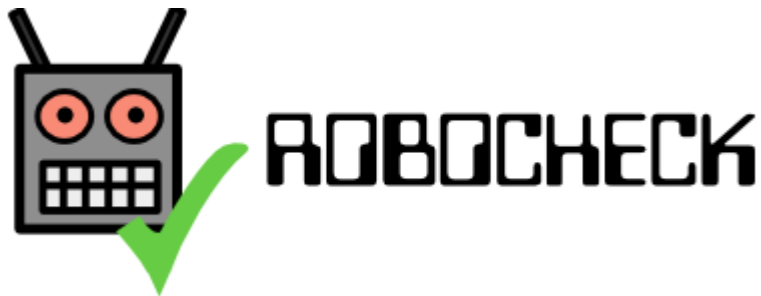# Robocheck Interoperability

- run Robocheck
- retrieve output

Robocheck Interoperability

- run Robocheck
- retrieve output
- integrate in *grade.vmr*

Robocheck Interoperability

Nota și observații

```
+0.0: nice coding style :)
-- Irina
```

Date și depunctări

```
Data trimiterii temei : 2012.03.18 13:23:45
Deadline temă        : 2012.03.27 23:50:00
Temă trimisă înainte de termenul limită cu 9 zile 9 ore 26 minute 15 secunde.

Depunctare întârziere : 0
Depunctare corectare  : 0.0
Total depunctări      : 0.0
------------------------
Nota                  : 100.0
```

Robocheck Interoperability

Nota și observații

-0.20: New memory leak modification (In function execCommand, in file tema0.c, at line 189;)
-0.20: Use of unitialized variable (In function add, in file tema0.c, at line 61;)
-0.10: Use of non-static variables or functions in a single module (In file tema0.c, at line 21; In file tema0.c, at line 32; In file tema0.c, at line 46; In file tema0.c, at line 55; In file tema0.c at line 79; In file tema0.c, at line 103; In file tema0.c, at line 113; In file tema0.c, at line 124; In file tema0.c, at line 134; In file tema0.c, at line 143; In file tema0.c, at line 162;)

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Depunctare corectare : -0.5

Overview

- ## solve usability issues
  - expand Splint module with other error types
  - modify Simian parser

- ## simplify configuration process
  - configuration tool instead of XML edit

- ## ensure portability for Windows platform

- ## integrate with vmchecker

Future Development

Future Development

- expand functionalities of the integrated tools

Future Development

- expand functionalities of the integrated tools
- multiple programming language support

vmchecker

easy configuration

Simian

portability

Valgrind

Memcheck

C89 vs. C99

ROBOCHECK

JSON

interoperability

linker and loader

Splint

Dr. Memory