Computational Logic

CoCoWeb
A Convenient Web Interface for Confluence Tools

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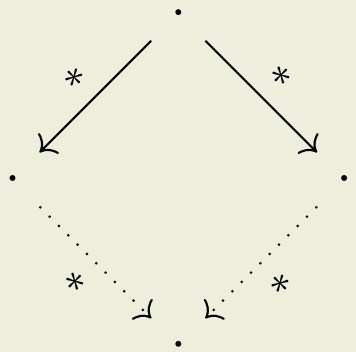
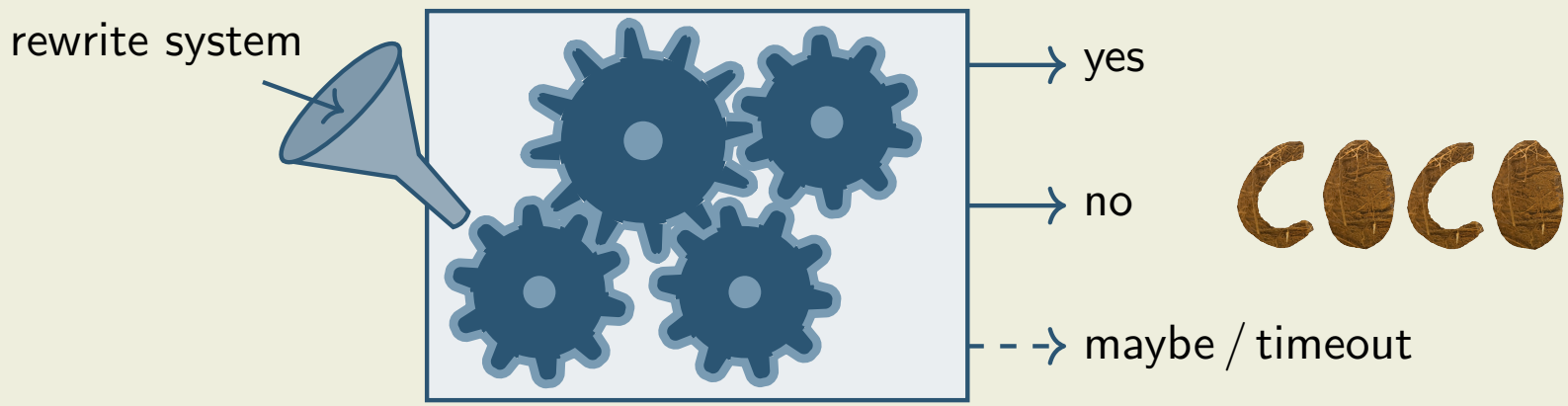
Automatic Confluence Analysis

Confluence Criteria



Knuth and Bendix, orthogonality, strongly/parallel/development closed critical pairs, decreasing diagrams (rule labeling), parallel and simultaneous critical pairs, divide and conquer techniques (commutation, layer preservation, order-sorted decomposition), decision procedures, depth/weight preservation, reduction-preserving completion, Church-Rosser modulo, relative termination and extended critical pairs, non-confluence techniques (tcap, tree automata, interpretation), ...

Automation



Confluence Tools at CoCo

	TRS	CTRS	CPF		HRS	GCR	UN		
			TRS	CTRS			NFP	UNC	UNR
ACP	✓		✓						
ACPH					✓				
AGCP						✓			
CeTA			✓	✓					
CO3		✓							
CoLL-Saigawa	✓								
ConCon		✓		✓					
CSI	✓		✓				✓	✓	✓
CSIˆho					✓				
FORT						✓	✓	✓	✓
SOL					✓				

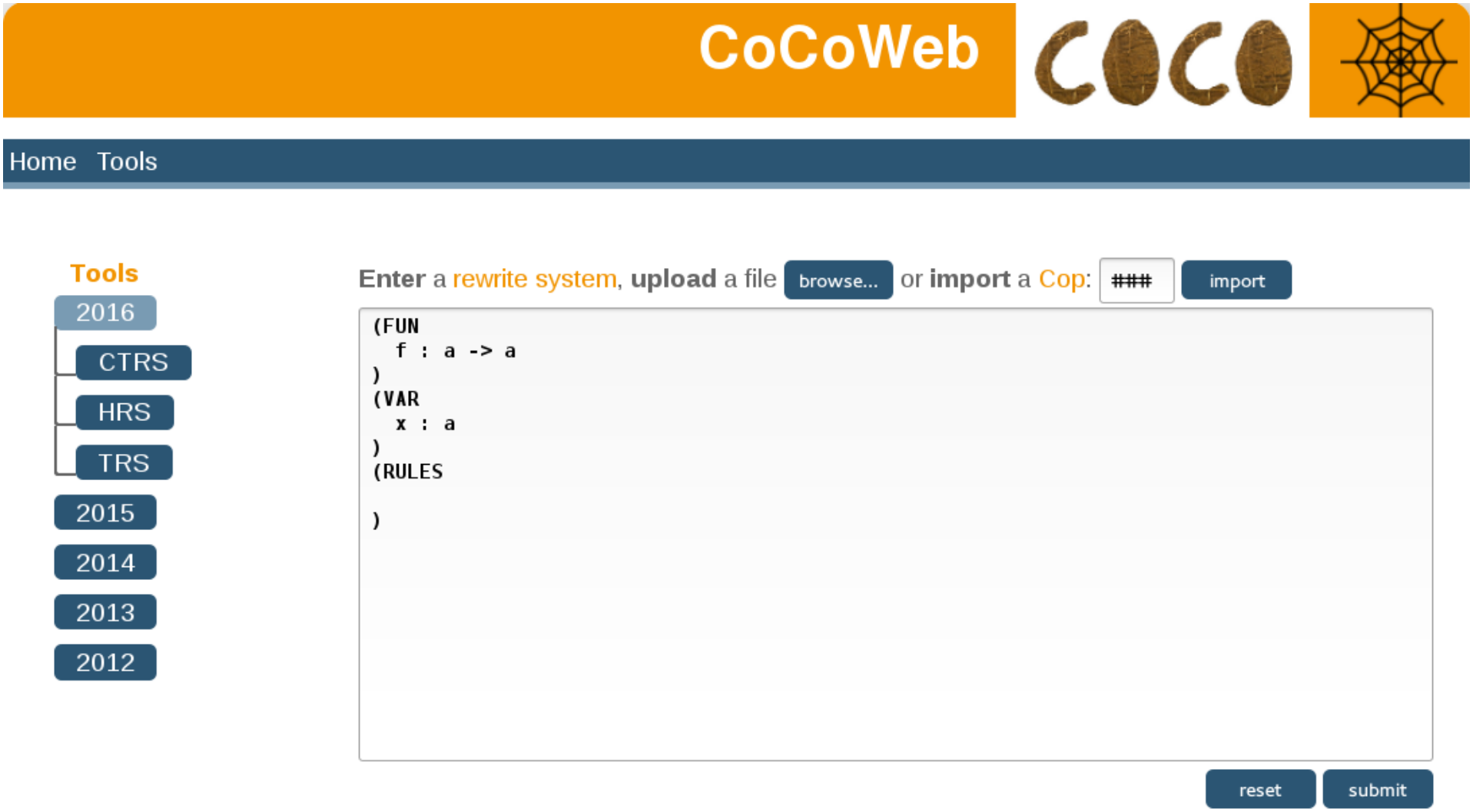
2017

How to Run Tools as User?

- download and install locally
- web-interfaces
- CO3: `http://www.trs.cm.is.nagoya-u.ac.jp/co3/index.html`
- ConCon: `http://colo6-c703.uibk.ac.at/csag9384/concon_webinterface/`
- CSI(^ho): `http://colo6-c703.uibk.ac.at/csi/index.php`
- . . . ?

Quote

Note that we have tried to show confluence [. . .] by confluence checker ACP and Saigawa, and both of them failed.


CoCoWeb
Home Tools
Tools
2016
CTRS
HRS
TRS
2015
2014
2013
2012
Enter a rewrite system, upload a file browse... or import a Cop: ### import
(FUN
f : a -> a
)
(VAR
x : a
)
(RULES
)
reset submit

Implementation Details

- PHP
- user input sent with HTTP POST
- dynamic parts with VanillaJS
- styled with CSS3

```
.tools input[type="checkbox"]:checked + label {
  color: white;
  background-color: #799BB3;
}
```

- $<$ 500 lines

Tools

- menu generated automatically
- small config files specify tool invocations

```
TOOLDIR="Saigawa-2012/bin"
TOOL="./starexec_run_saigawa -t $TO $FILE"
```

- tools are executed sequentially using

```
DIR=$(pwd -P)
FILE=$(readlink -f $2)
TO=59
TOT=61
TOK=63
source $1
pushd $DIR/bin/$TOOLDIR > /dev/null
/usr/bin/time -f "\nTook %es" timeout -k $TOK $TOT $TOOL
popd > /dev/null
```

Conclusion

CoCoWeb

- single entry point to all CoCo participants
- useful for finding killer examples, reviewing, exams, submission and integration into Cops, ...

Non-goal

- framework for experiments and benchmarking — StarExec

Possible Extensions

- automatic tool selection based on input format
- add new categories like ground-CR and UN — automatic tool selection?
- allow setting time limit
- ...?