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**FACULTY  
OF INFORMATION  
TECHNOLOGY  
CTU IN PRAGUE**

Master's thesis

**Thesis title (SPECIFY)**

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Department of ... (SPECIFY)

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October 22, 2020



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## Acknowledgements

THANKS (remove entirely in case you do not wish to thank anyone)



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## Abstrakt

V několika větách shrňte obsah a přínos této práce v českém jazyce.

**Klíčová slova** Replace with comma-separated list of keywords in Czech.

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## Abstract

Summarize the contents and contribution of your work in a few sentences in English language.

**Keywords** Replace with comma-separated list of keywords in English.



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# Introduction





# State-of-the-art



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# Analysis and design

## 2.1 SOM design and features

- Data types: Integer, Char/String, (Boolean, Float)
- Basic arithmethics (boolean arithmethics?)
- Bitwise operations
- Classes - fields, methods, single inheritance, dynamic dispatch (late binding)

## 2.2 Parsing

TBD, use parser generator (ANTLR)?

## 2.3 Interpretation

Multiple approaches, varying in difficulty of implementation, speed ...

### 2.3.1 AST interpretation

Easier implementation, but quite inneffective.

- Changes to AST require changes to interpreter.
- Not effective - speed, memory requirements.

### 2.3.2 Bytecode interpretation

Using a form of bytecode. Effective, requires:

- designing the bytecode (instructions, bytecode file formats),

- AST to bytecode translation (AST  $\rightarrow$  bytecode instructions),
- actual bytecode interpretation.

Bytecode interpretation permits easier optimization.

### 2.4 Optimization

- dead code elimination,
- constant propagation,
- others...

### 2.5 Virtual Machine

Decide on memory hierarchy, garbage collection...

#### 2.5.1 Garbage collection

# Realisation



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## Conclusion





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## **Bibliography**



## Acronyms

**GUI** Graphical user interface

**XML** Extensible markup language



## Contents of enclosed CD

	readme.txt .....	the file with CD contents description
	exe .....	the directory with executables
	src .....	the directory of source codes
	wbdcm .....	implementation sources
	thesis .....	the directory of $\text{\LaTeX}$ source codes of the thesis
	text .....	the thesis text directory
	thesis.pdf .....	the thesis text in PDF format
	thesis.ps .....	the thesis text in PS format