TECHNISCHE UNIVERSITÄT DRESDEN

Department of Computer Science Institute for Software and Multimedia Technology, Software Technology Group

How to Diss?
Effectively and Efficiently

Thomas Kühn
Output Dresden

14.06.2018

Funded by
DFG Deutsche Forschungsgemeinschaft

DRESDEN concept
Exzellenz aus Wissenschaft und Kultur

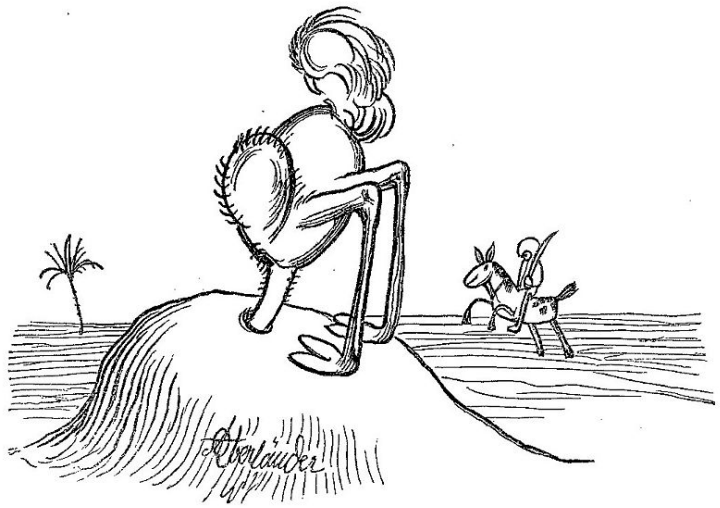
How to Diss
This is Not About

The place
https://www.google.com/maps/place/Dissen/@52.1122165,8.1720512,13z

The art of insulting
https://www.wikihow.com/Diss-Someone

Battle Rap
https://www.youtube.com/watch?v=NUC2EQvdzmY

PhD Process
† Disclaimer

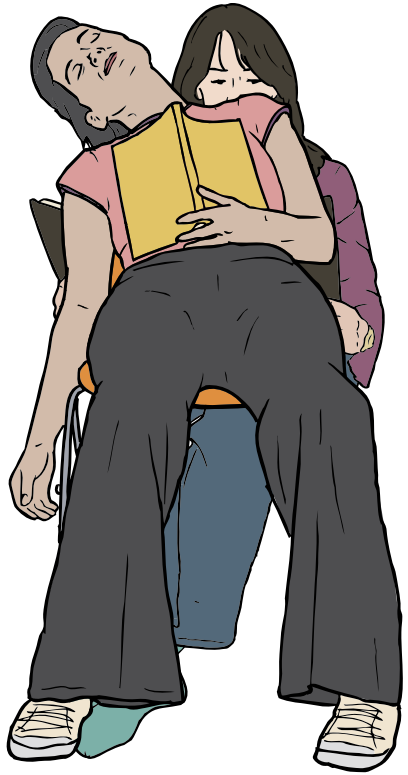


Adolf Oberländer (public domain)

- This thesis is computer-generated. No signature is required.
- This thesis uses results from tools that might be illegal in your jurisdiction.
- Some passages in this thesis might be computer-generated.

PhD Process
Daily Business

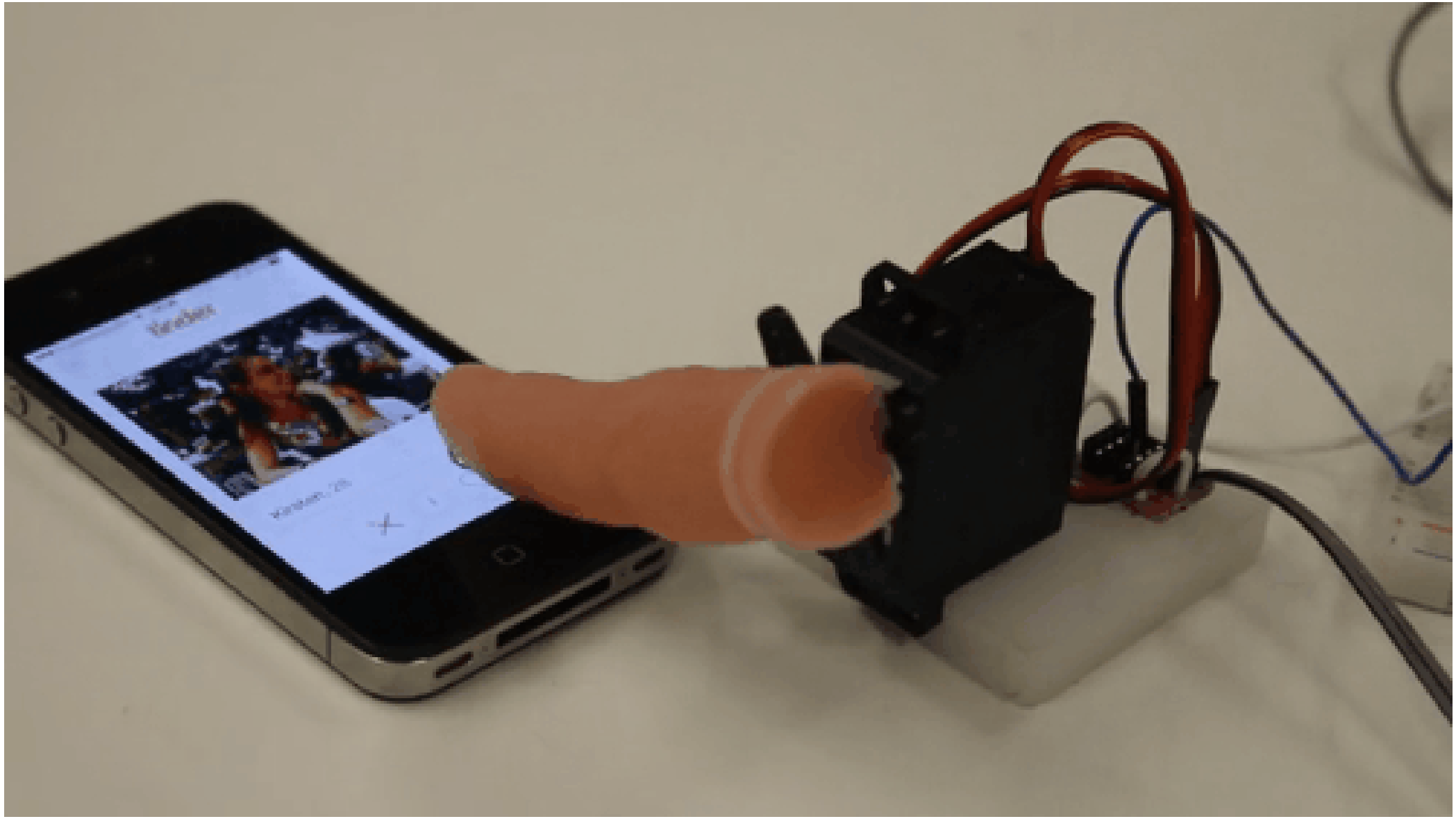
Reading



Writing

Organizing

Images from OpenClipart.org (Creative Commons by Steve Lambert)

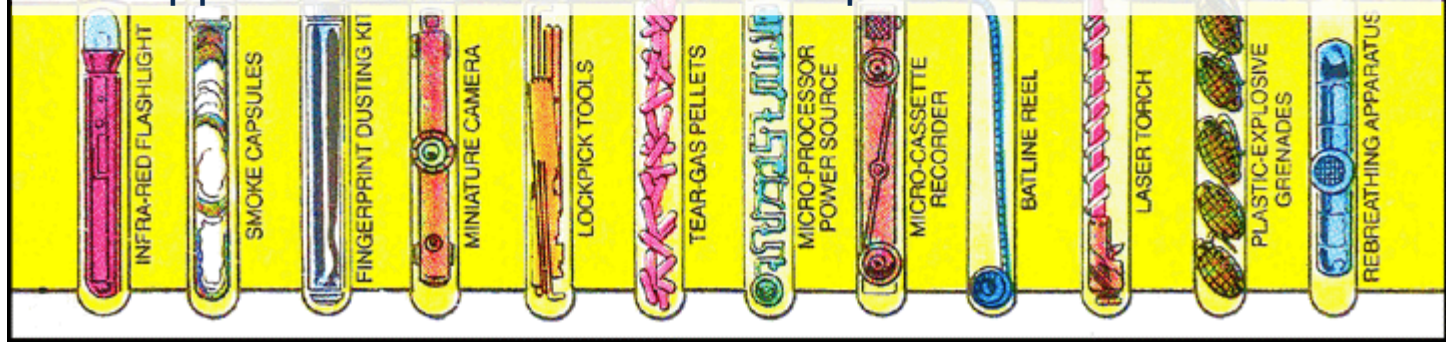


Common Tasks

- Management of stored papers
  - Search text fragments in papers
  - Look up *BibTex* for stored papers
- Conducting a literature survey
  - Look up *BibTex* for specific publications from the web
  - Filtering large *BibTex* files
  - Downloading papers
  - Classifying found papers

Organizing
What I Needed?

- ***getbibtex.rb***†
  Fetches bibtex entries for stored papers
- ***gsresearch.rb***†
  Collects bibtex entries from Google Scholar
- ***bibfilter.rb***
  Filters large BibTex files by various criteria
- ***gsdownload.rb***†
  Downloads all files referenced by a BibTex files
- ***SLR-toolkit***
  Supports classification of multiple BibTex items

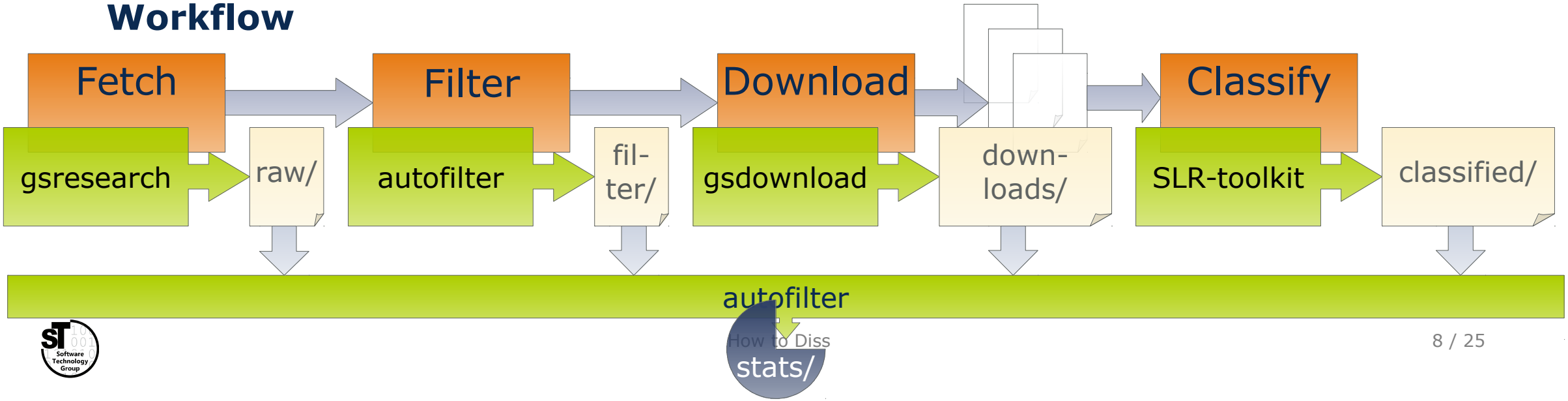


All DC Comics characters and the distinctive likeness(es) thereof are Trademarks & Copyright © 1935-2014 DC Comics, Inc. ALL RIGHTS RESERVED.

Efficient Organizing
Structured Literature Survey

- Fetch all publications matching a query string
  - ***With:*** *software programming language*
  - ***Without:*** *rbac policy sociology bio psycho*
  - ***From:*** *2000-2014(first round),*
  - ***Exact:*** *role based*
  - ***Any:*** *modelling modeling*
  - *2000-2016 (second round)*
- Sort out irrelevant publications
- Download PDF files for all relevant publications
- Collect statistics about survey process

Workflow



PhD Process
Daily Business

Reading

Organizing

Writing

Images from OpenClipart.org (Creative Commons by Steve Lambert)

Writing
How it feels like

Images from https://parske-shop.de/Gartentechnik/Haecksler/Erco-Holzhaecksler-GHX-CH1900-Zapfwelle-oder-Benzin.html

Writing
How it should be

Image from MaxPixel.net (Creative Commons by Markus Baumeler)

Writing
What I needed?

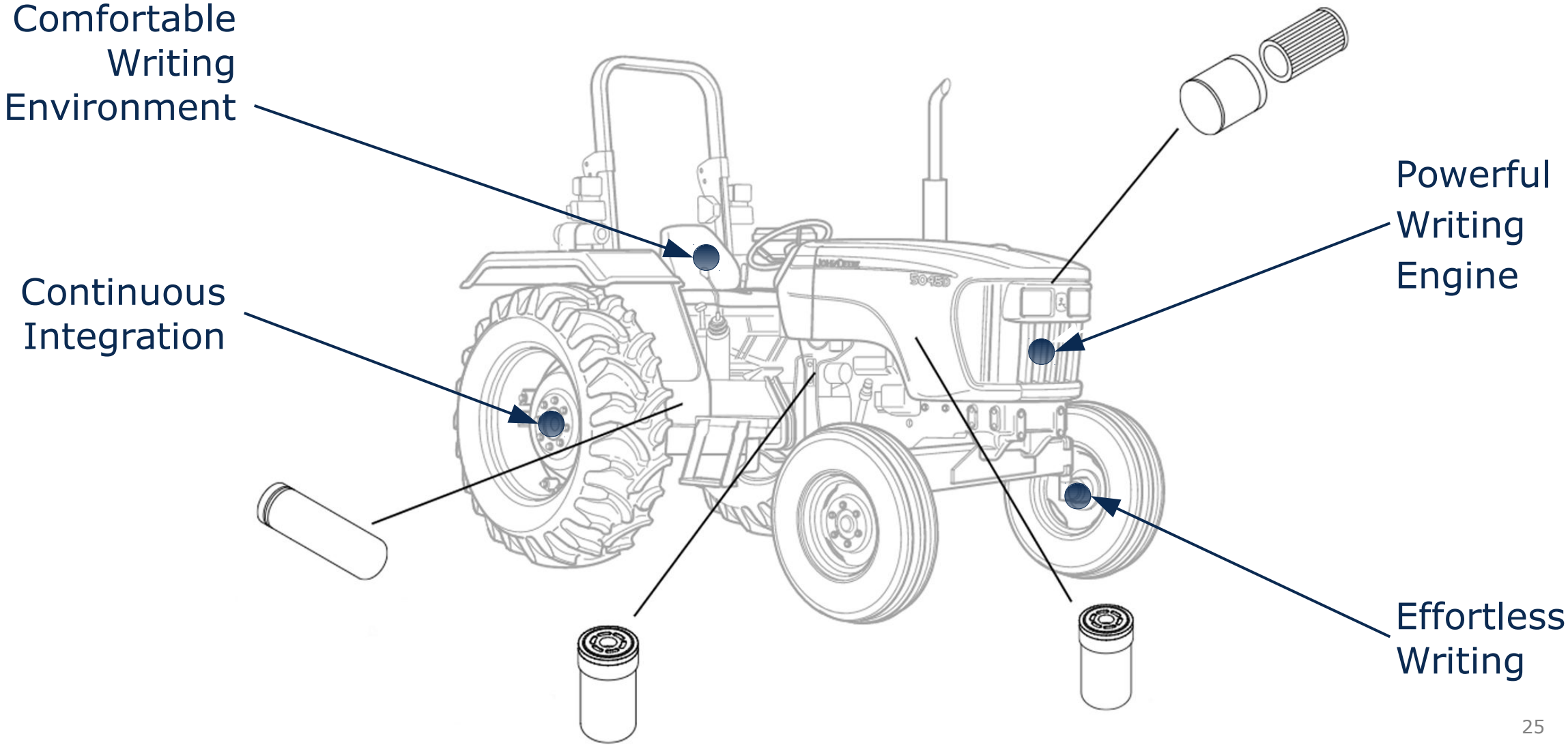


Image from https://www.deere.com/en/tractors/utility-tractors/5-family-utility-tractors/

```
# This is another H1
## This is another H2
*This is an italic text*
_This is a text with an underscore_

**This is a bold text**
The following is a Quotation:

> Lorem ipsum dolor sit amet,

![This is an Image](rosi.png "This is the alt text")

## Lists
* Item of a bullet list
* Another Item

1. An Item of an ordered list
2. Yet another Item

## Highlights

This is a code block:
    $ pandoc --help
And this a link to [Pandoc](http://johnmacfarlane.net/pandoc/).
```

Multimarkdown

- Focus a simple syntax to both *read* and *write*
- Markdown extension by *Fletcher T. Penney* to support research activities
- Important features are: *Footnotes, Tables, Citations, …*

Pandoc[1]

- Command line tool written in Haskell
- Available for **all** platforms
- Direct transformation to
  - XHTML, HTML 5,
  - LaTeX,
  - EPUB (v2 or v3), ...
- Supports customized templates

1) http://johnmacfarlane.net/pandoc/

thesis.md.erb

```
%A Family of Role-Based Languages
%Thomas Kühn
%3.3.2017
---
replacefont: fourier
lang: "english"
natbib: true
bibstyle: uwelike
# required for a dissertation
title: 'A Family of Role-Based Languages'
author: "Thomas Kühn"
# …
dateofbirth: "11.09.1985"
defensedate: "24.3.2017"
placeofbirth: "Karl-Marx-Stadt (now Chemnitz)"
…

<% if @variant==:latex %>
<%= load("parts/publications.md.erb") %>
<% end %>

<%= load("parts/state-of-the-art.md.erb") %>

<%= load("parts/solution.md.erb") %>
```

Panruby

- Ruby-based command line tool
- Employing ERB as template engine
  - `<% … %>`
    Execute without return value
  - `<%= … %>`
    Execute and return value
- Include files into documents
- Conditional creation of content
- Embed source code in documents

Thesis Template

- Creation of a pandoc-Template for phd thesis based on `tudscr`
- Includes multiple options to customize fonts, pagestyle, and layouts

make.sh

```
#!/bin/bash
git remote update
TEMPLATE="tdissertation.tex" ;
DOCUMENT="thesis"
LOCAL=$(git rev-parse "@{0}")
REMOTE=$(git rev-parse "@{upstream}")
BASE=$(git merge-base "@{0}" "@{upstream}")
if [ $LOCAL = $REMOTE ]; then
  echo "Already up-to-date."
elif [ $LOCAL = $BASE ]; then
  git pull
  echo "Executing panruby..."
  ruby panruby.rb latex $DOCUMENT $TEMPLATE > $DOCUMENT.md.log;
  latexmk -halt-on-error -pdf $DOCUMENT;
  # commit changes
  git add $DOCUMENT.pdf $DOCUMENT.tex
  git commit -m "compiled"
  git push
elif [ $REMOTE = $BASE ]; then
  echo "You have local changes!"
else
  echo "Diverged"
fi
```

Simple Shell Script

- Periodically check git for updates
- In case of updates
  - Execute `panruby`
  - Execute `latexmk`
  - Commit and push changes
- Runs *(almost)* everywhere

Family-of-rpls.md.erb

```
# Contemporary Role-based Programming Languages {#cha:rpls}
<!-- ... -->
### JavaStage {#sec:javastage}

<% if @variant==:latex %>
~~~{#lst:wtf .java float=t}

~~~

\setcounter{lstlisting}{3}
<% end %>

~~~{#lst:jstage .java caption="Bank example implemented with JavaStage." float=tb}
<%= load("src/javastage.java") %>
~~~

<% if @variant==:latex %>
\setcounter{lstlisting}{4}
<% end %>
```

- No support for *custom languages* in listings
- Markdown tables to inflexible
- No direct support for references to
  - *Figures*,
  - *Tables* and
  - *Acronyms*
- **Bugs** sometimes hard to debug

Interlude
Valley of Shit[3]

"All of a sudden he seemed to lose confidence in himself, his topic and the quality of the work he had done."
– Inger Mewburn

- Typical phase in any thesis process
- Caused by
  - working without immediate reward
  - Focusing on full task
  - Loosing track of your progress
- Can cause *depression*

3) https://thesiswhisperer.com/2012/05/08/the-valley-of-shit/

Interlude
Motivate Yourself

SLE`14

SLE`15

SPLC`15

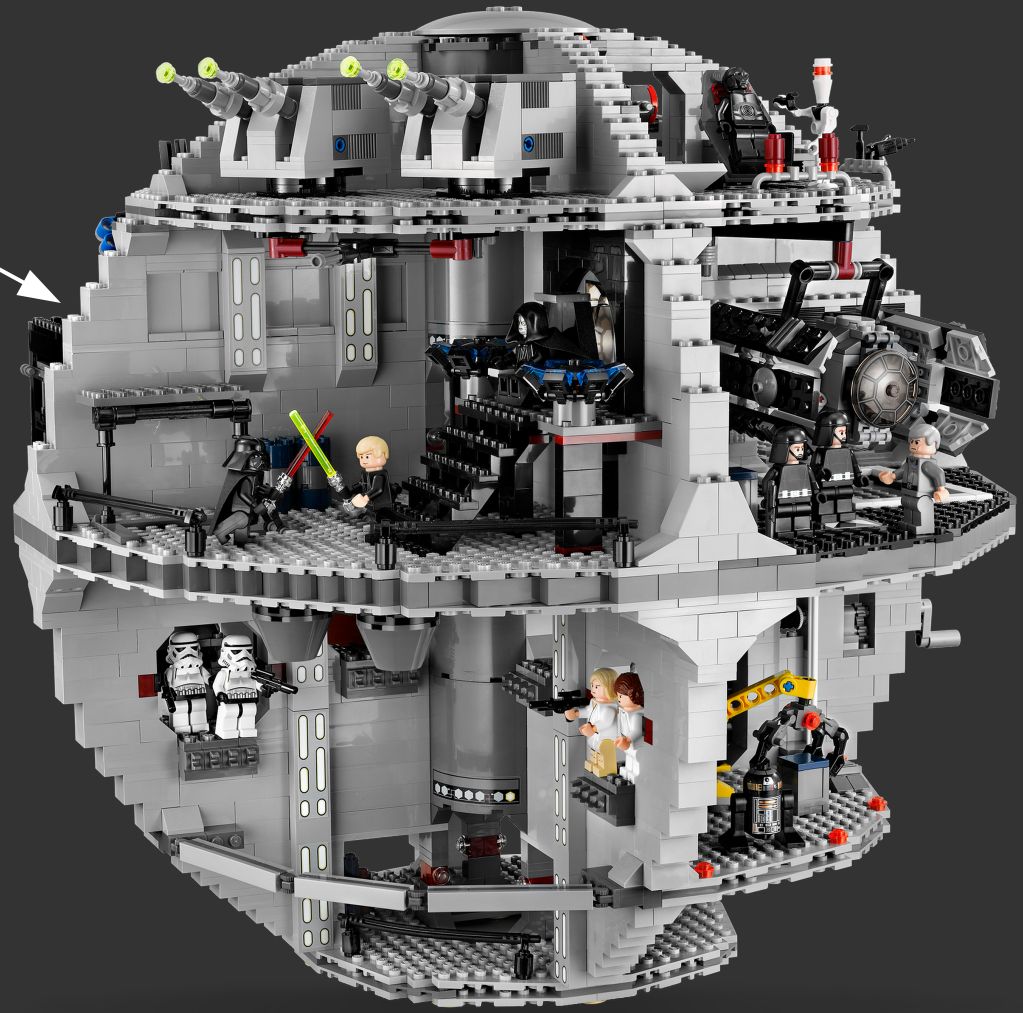
SPLC`16

SLE`17

- Find reward strategy
- Trick your brain
- Keep your dopamine level up

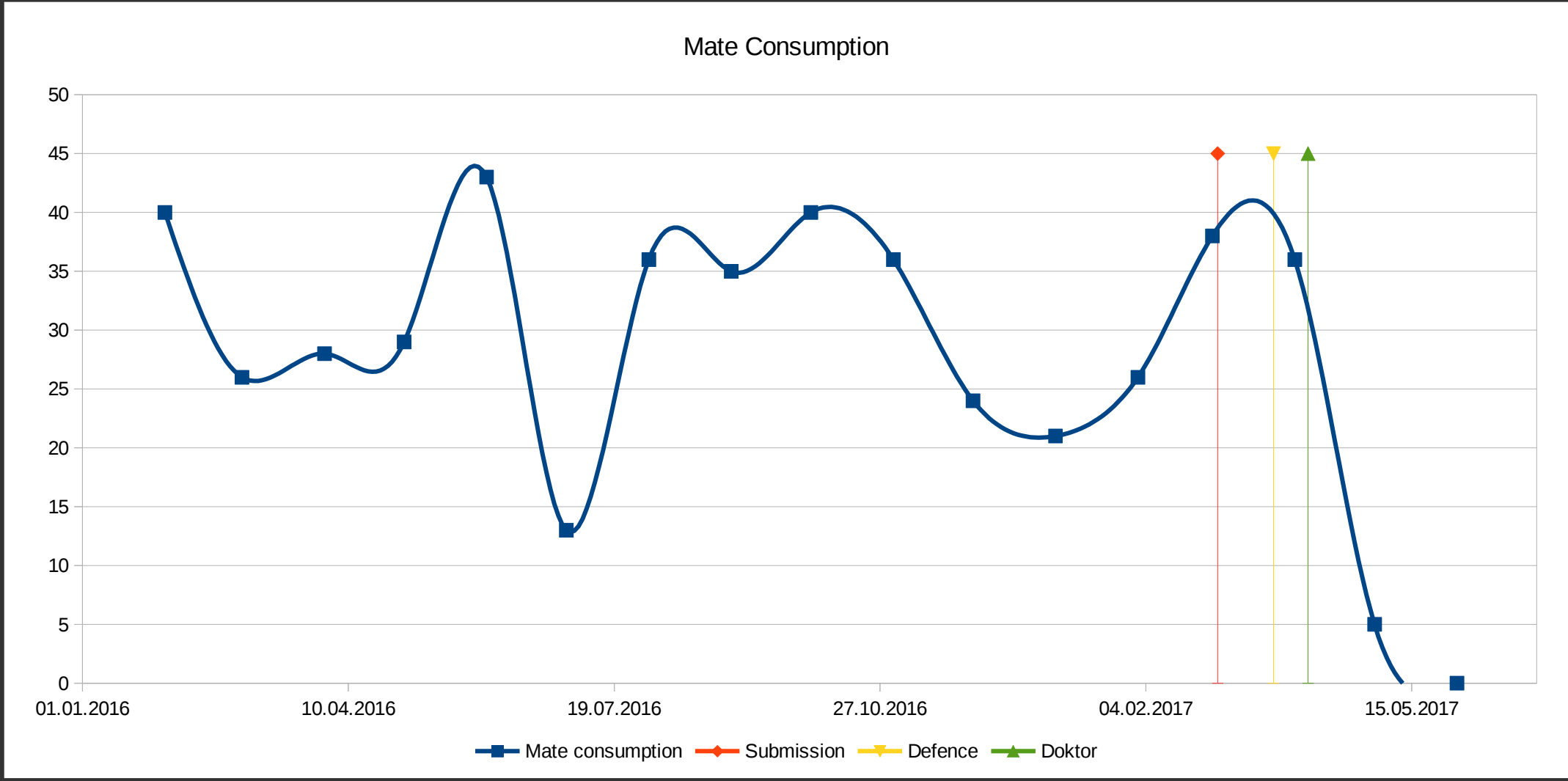
LEGO, the LEGO logo and the Minifigure are trademarks and/or copyrights of the LEGO Group.

Grand Price

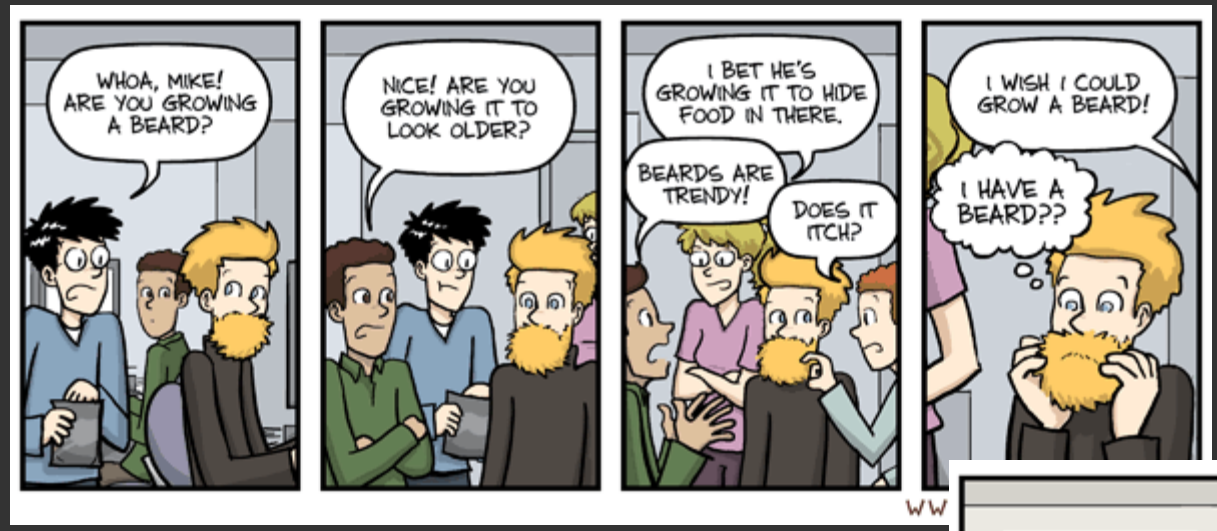


LEGO, the LEGO logo and the Minifigure are trademarks and/or copyrights of the LEGO Group.

Interlude
Avoid Bad Habits



The Beardening



"Piled Higher and Deeper" by Jorge C

Efficient Writing
Generate All The Things

genevaluation.erb

```
# Text templates
additions=["Furthermore", "Indeed", "In addition", "Moreover",
"Besides", "In fact"]
# …
Textperclass=[ # …
lambda {|ext,add,name,complete,partial|
  r="#{add}, *#{name}* incorporates the contextual"
  r<<" Features #{complete} fully"    unless complete.empty?
  r<<" and"                 unless partial.empty? or complete.empty?
  r<<" Features #{partial} partially"  unless partial.empty?
  r<<"."
} ]
```

Generated_20170112.md

 # JavaStage

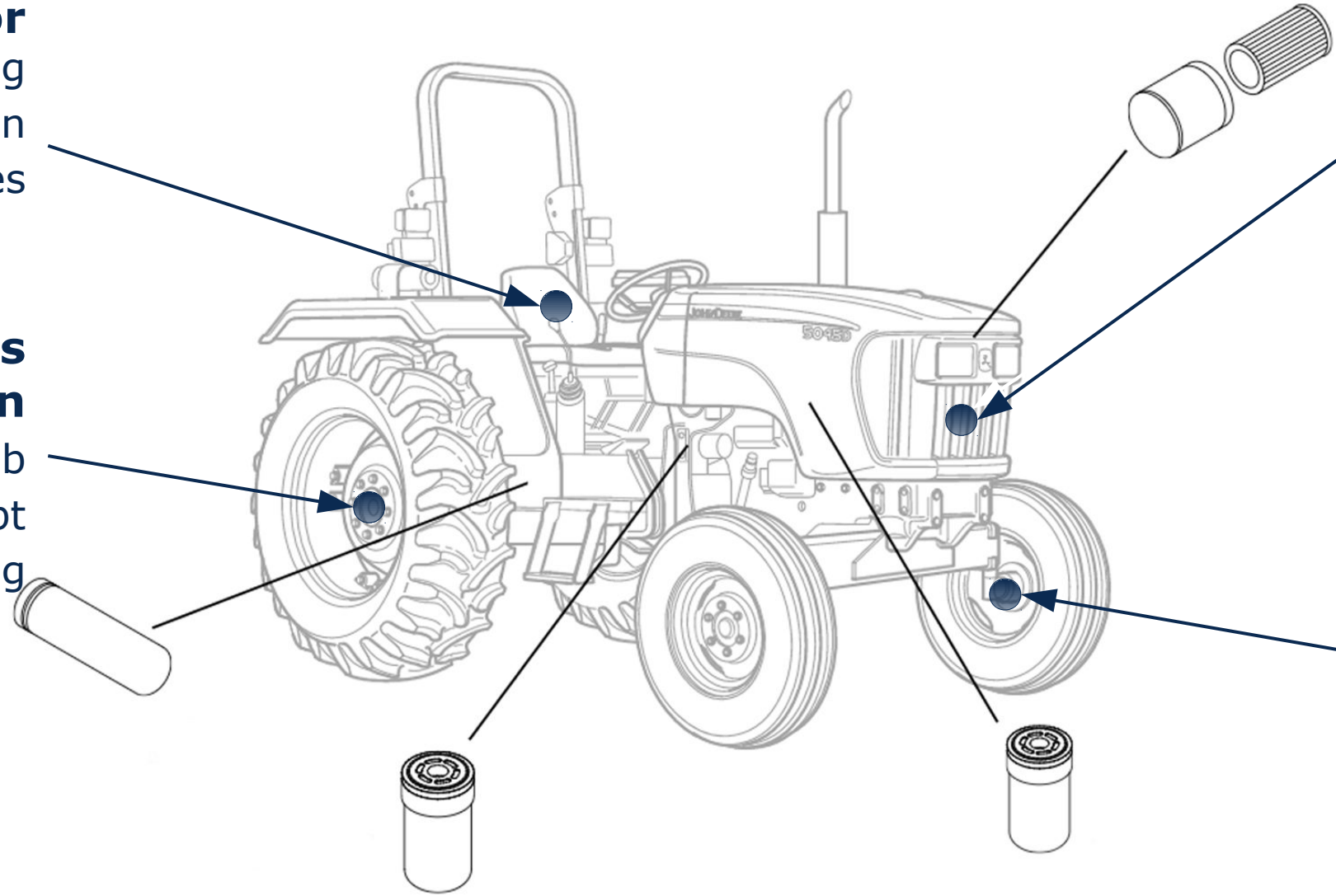
In general, ***JavaStage*** supports the behavioral nature of roles [@barbosa2012]. In other words for the behavioral nature, it supports Features 1, 3, 6--8, 10--13, and 15 completely as well as Features 4 partially. Specifically, roles have properties and behaviors, objects may play different roles simultaneously, the sequence of role acquisition and removal may be restricted, unrelated objects can play the same role, roles can play roles, the state of an object can be role-specific, features of an object can be role-specific, roles restrict access, roles can inherit features, and an object and its roles have different identities. Although, JavaStage only partially provides that objects may play the same role (type) several times.

- Generate LaTeX *tables*
- Generate *PDFs* from *SVG*
- Generate *Plots* with *tikz*
- Generate *Text* from *classification*

PhD Process
Conclusion

Favorite Editor
Syntax Highlighting
Auto Completion
Templates

Continuous Integration
GitLab
Build Script
Error Log

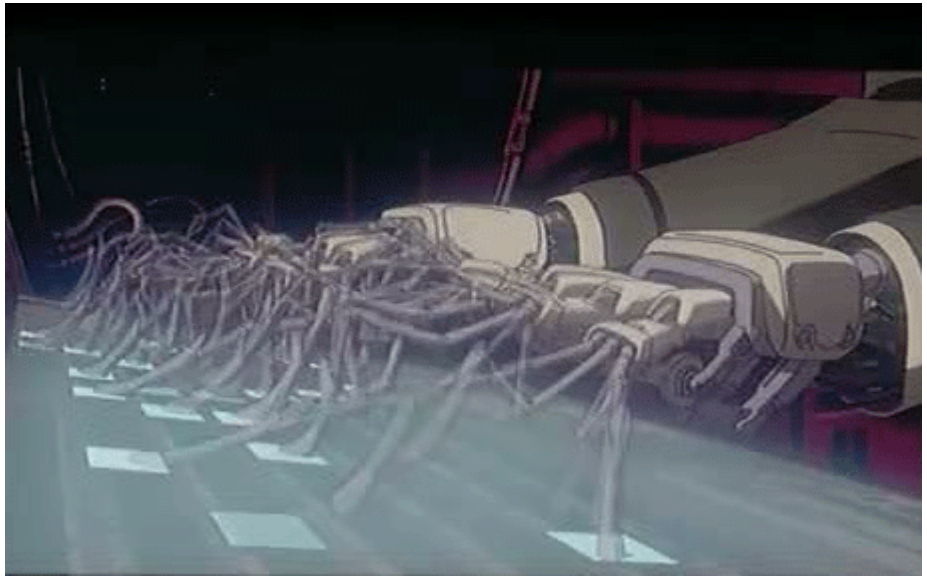


Panruby
Multimarkdown
+ Ruby
Configurable
Templates

Automatic Generation
Tables
Plots
Text

Image from https://www.deere.com/en/tractors/utility-tractors/5-family-utility-tractors/

Future Work



"Ghost in the Shell" by Production I.G ALL RIGHTS RESERVED

- Generate different version
  - Text for *visually challenged*
  - HTML for *online reading*
  - EPUB for *offline reading*
- Include *Language Tools* into continuous integration
- Add acronym and reference support

On Github

- **Bibfilter**

  https://github.com/Eden-06/bibfilter
- **gsresearch**

  https://github.com/Eden-06/gsresearch
- **panruby**

  https://github.com/Eden-06/panruby