

Creating dynamic tools with Galaxy ProTo

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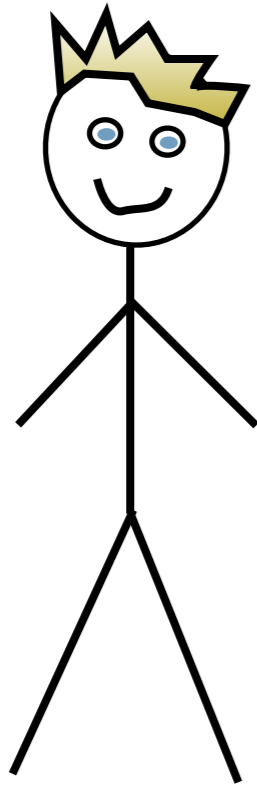
GCC2015
July 8. 2015, Norwich

Outline

- Basic scenario
- Galaxy ProTo
- Demo
- Small discussion

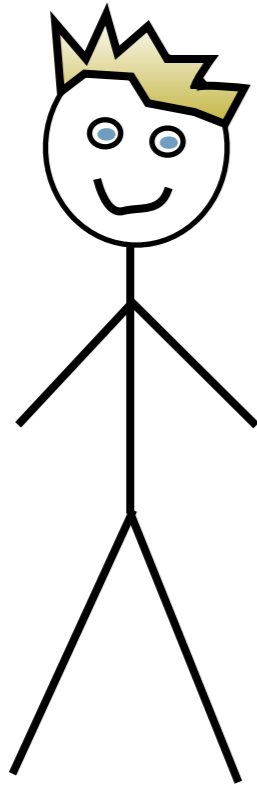
Basic scenario

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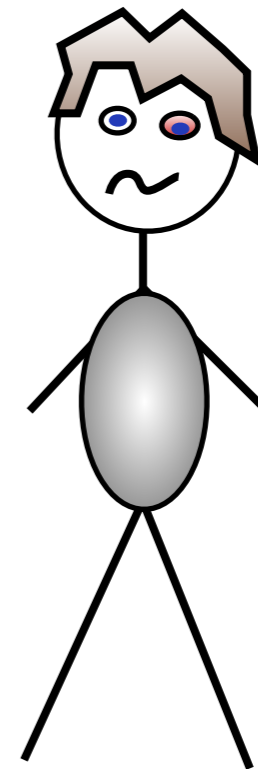


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Biologist/
bioinformatician, PhD

Basic scenario

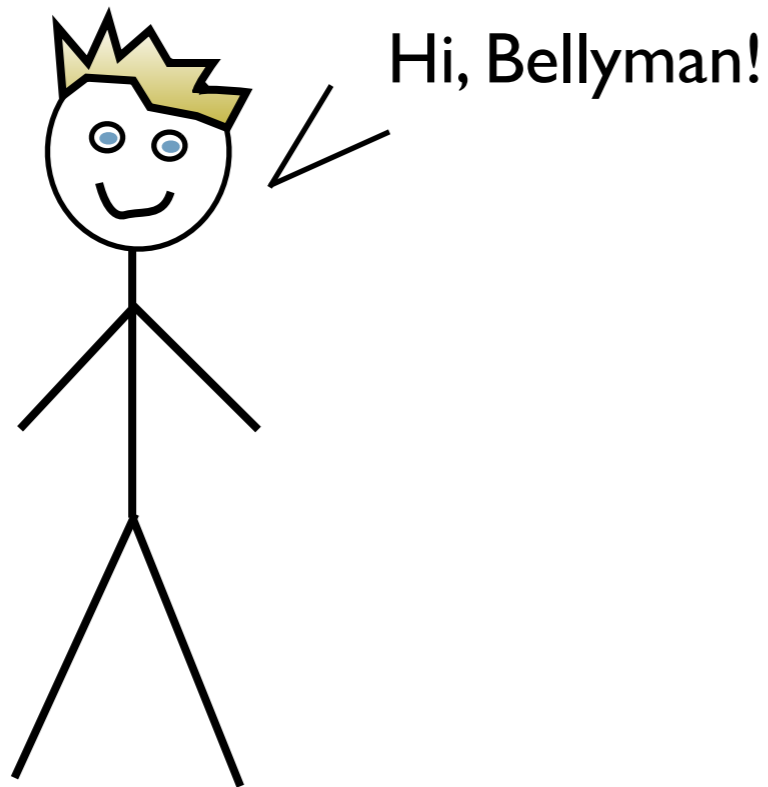


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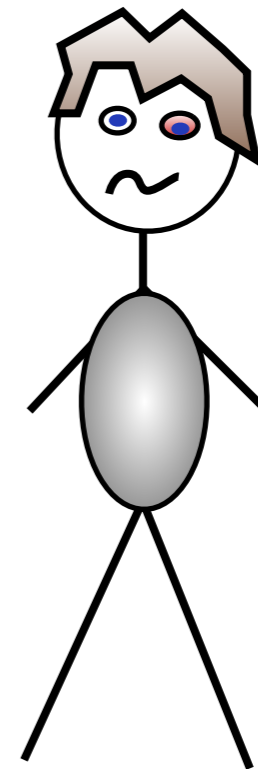


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Galaxy admin/
tool developer/
system administrator/
sleep-deprived father of
newborn kid

Basic scenario

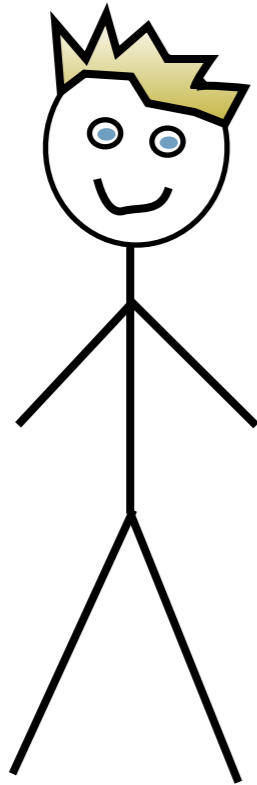


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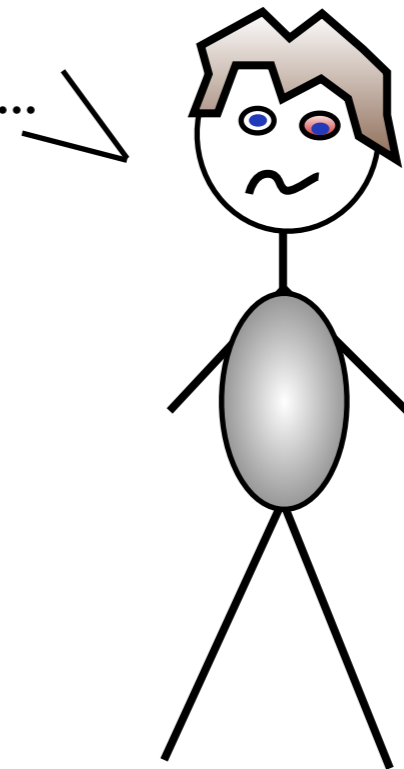
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Basic scenario



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...yeah.. hi.. Stickman...

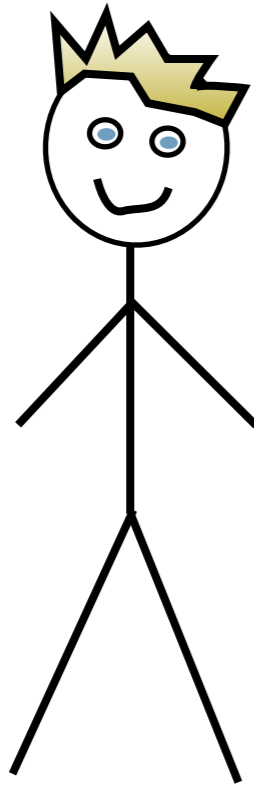


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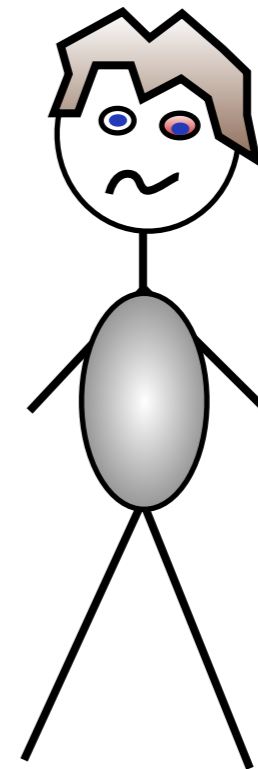
Basic scenario

So...

I wrote this incredible script that solves all my problems, that I want to share with the world as part of my impressive new publication! Could you create a Galaxy wrapper for it and include it with our public Galaxy installation? And add some parallelization? And perhaps some nice visualization? That shouldn't be too much work, should it? It is not like you are doing any real stuff anyway!



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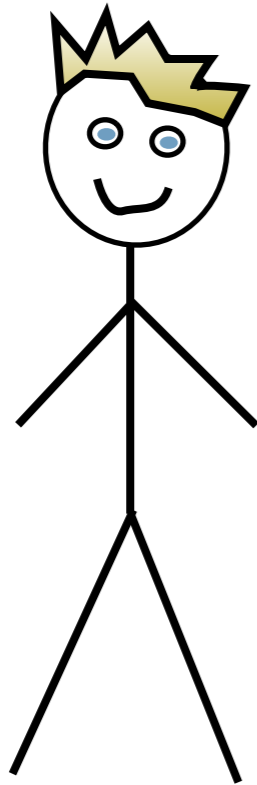
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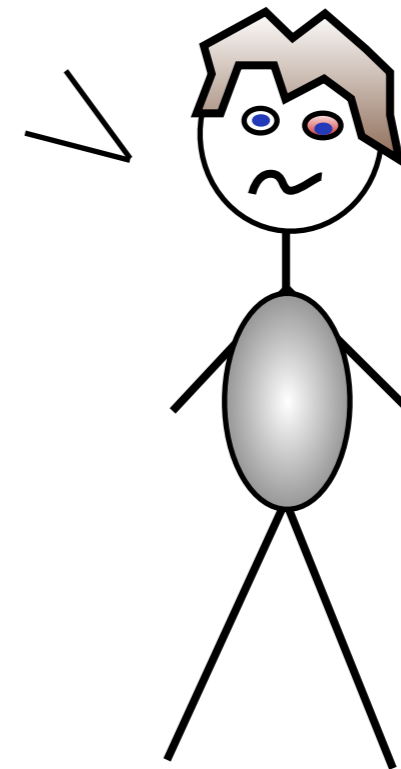
...yeah...

...well I do not really
have much time to
spend on that...

...could you not try... I
mean... to develop the
wrapper...
...yourself... ?

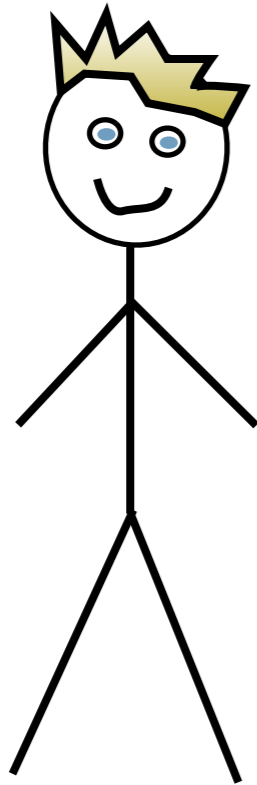


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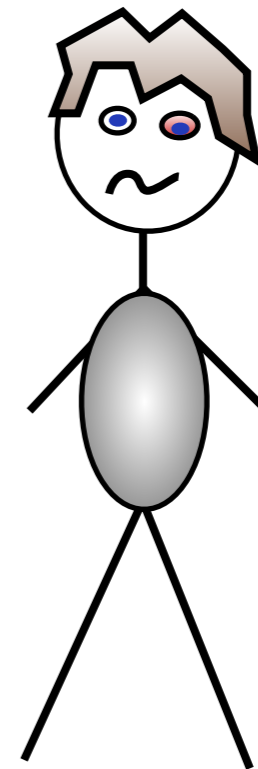


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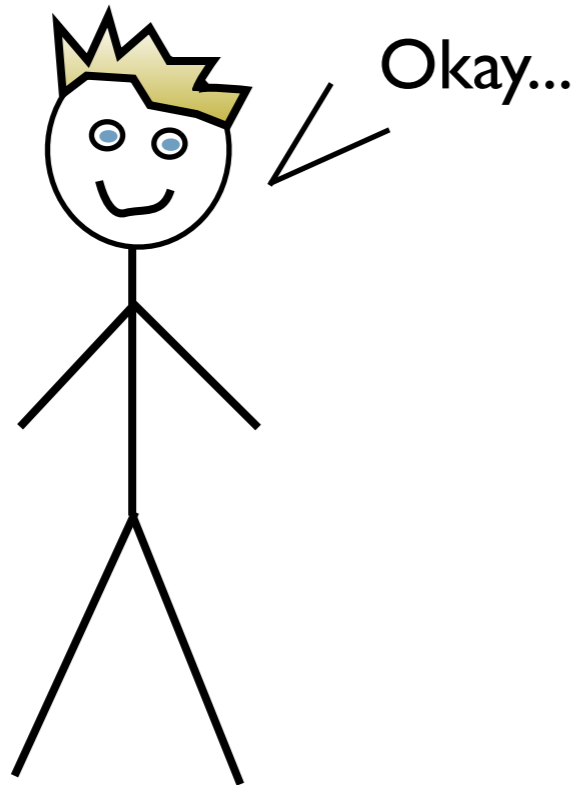


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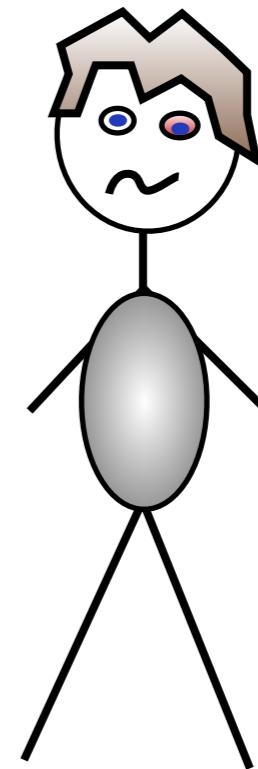


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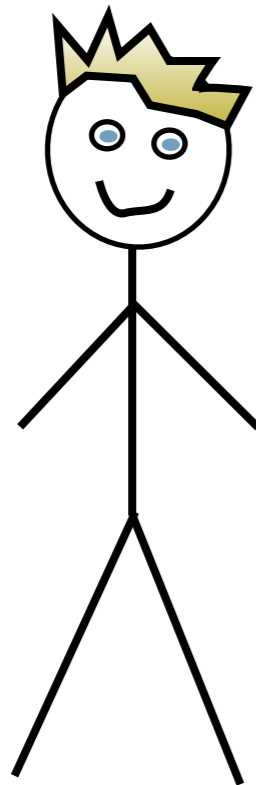


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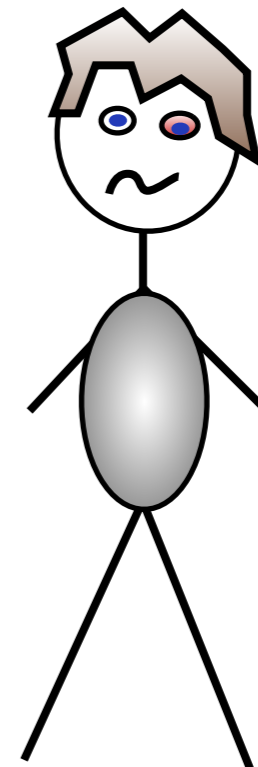
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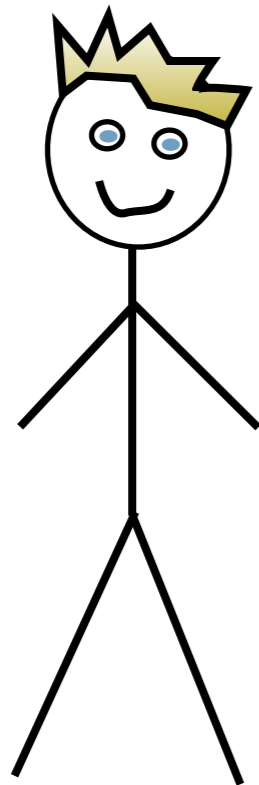
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If you do not want to
help me, that's fine.
Where do I start?



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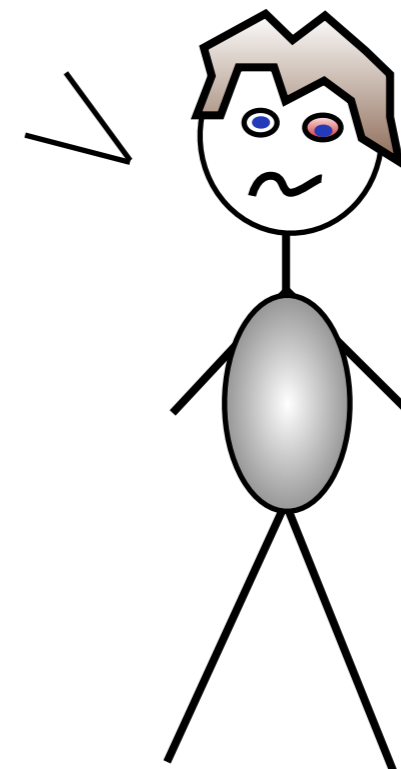


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...well...

...you should start with
learning the XML syntax
of Galaxy.

I'll send you the link!

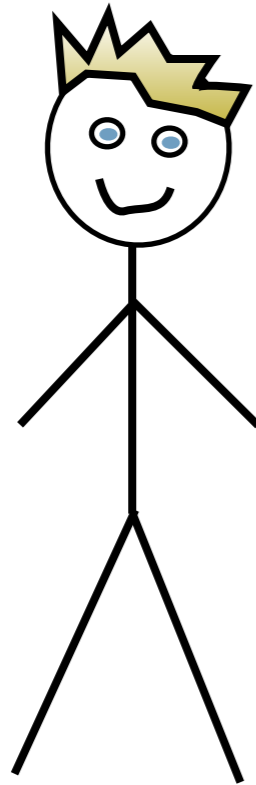


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One hour later..

Basic scenario

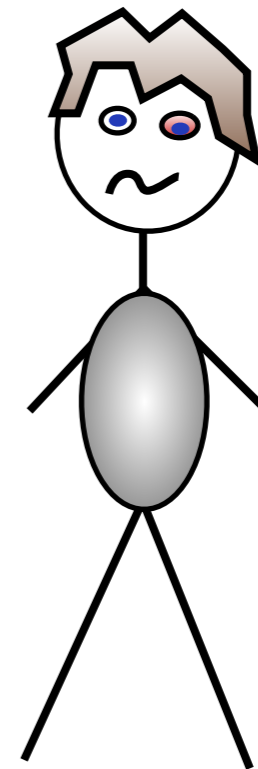
Hi, Bellyman!



I looked at the link
and it seemed a little
complicated.

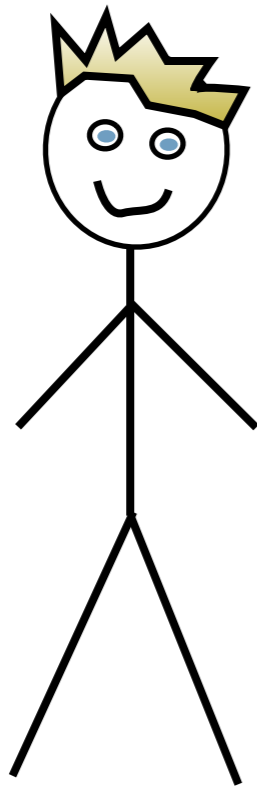
Say: what if I bought you a
pizza and a couple of
beers?

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Basic scenario



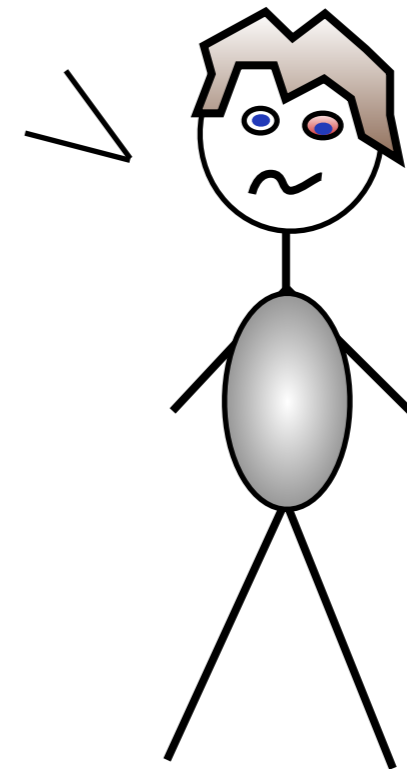
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...yeah...

...well...

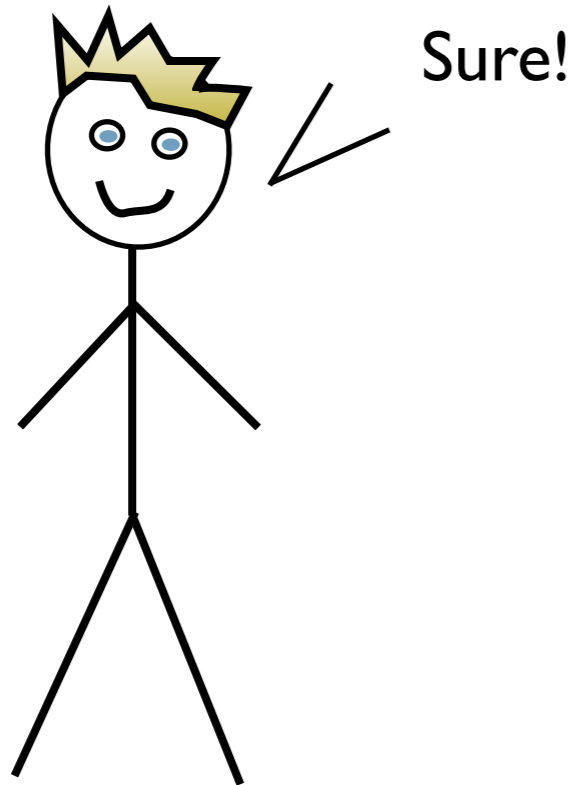
...i have another idea!

You know Python, right?

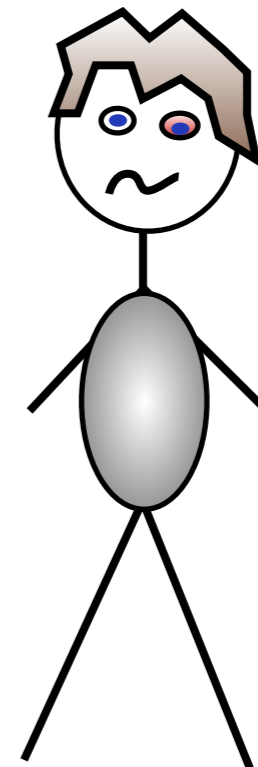


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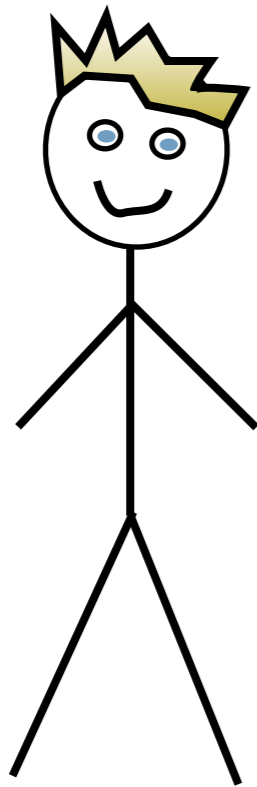


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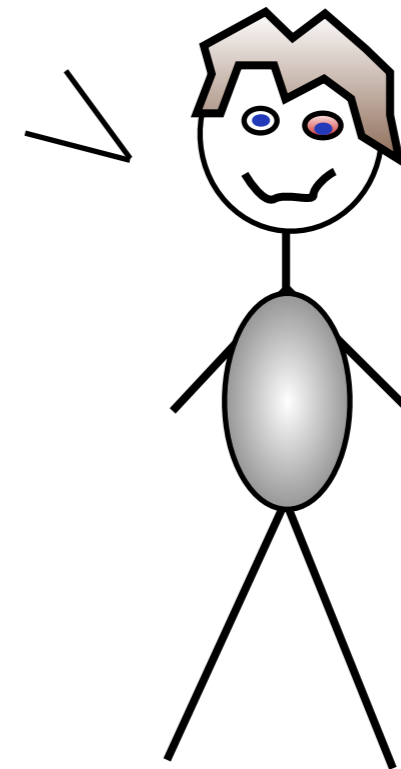
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Then I have a solution:

Galaxy ProTo!



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Galaxy ProTo

- Galaxy Prototyping Tool Interface
- Has been part of the Genomic HyperBrowser system since 2007 as an alternative to the Galaxy XML tool description

Main advantages

- Two main reasons for the creation of ProTo:
 - The main HyperBrowser developer did not want to spend time learning the Galaxy XML
 - The existing XML syntax did not support the amount of dynamics that we needed
- Advantage that came up later:
 - Prototypical implementation of web tools fully “on-the-fly”

Demo

Technical solution

- We implemented another web controller inside Galaxy, sidestepping the Galaxy one
- For each web request, we create a new fork with the ProTo process. This means that the source code is loaded for each click, making “on-the-fly” prototyping possible
- Also includes API to easily create HTML output

Disadvantages

- Does not (yet) support being a part of a workflow. Is thus usable mainly for interactive tools
- ProTo is a “hack” of Galaxy (but a nice and friendly one). Planemo is probably the tool creation solution for solid, well-tested tools for your life science infrastructure
- Advanced HTML output disabled by default in Galaxy (for security reasons)

On the other hand...

- With ProTo you can really do (almost) whatever you like, whenever you want to do it...
- Without leaving Python
- Very effective for prototyping!
- Has been proved to be a very nice solution for our informatics master students
- Easy way to provide working functionality on the web so that the supervisor/examiner can test it

Acknowledgments

- ProTo is mainly developed by Morten Johansen, part of the Genomic HyperBrowser team
- Usage and feature requests by the HyperBrowser team, as well as a bunch of informatics master students at the University of Oslo

Github

- Available as an alpha version on github:
- `git pull https://github.com/elixir-no-nels/
proto_release_15.03`
- Based on the march 2015 version of Galaxy, could be pulled and included with any existing Galaxy server

Support



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